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Basso et al.

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(54) **METHOD AND APPARATUS FOR MULTI-EXPERIENCE TRANSLATION OF MEDIA CONTENT WITH SENSOR SHARING**

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Related U.S. Application Data

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(51) **Int. Cl.**
H04N 21/2343 (2011.01)
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(Continued)

(52) **U.S. Cl.**
CPC ***H04N 21/23439*** (2013.01); ***G06Q 10/101*** (2013.01); ***H04N 21/233*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 21/233; H04N 21/2343; H04N 21/234309; H04N 21/23439;
(Continued)

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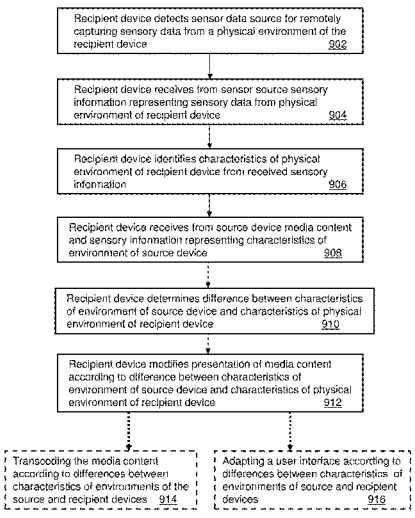
(74) *Attorney, Agent, or Firm* — Guntin & Gust, PLC; Douglas Schnabel

(57) **ABSTRACT**

A method and apparatus incorporates teachings of the present disclosure and may include, for example, a method including detecting at least one of a plurality of sensor data sources for capturing sensory data from a physical environment of the source device, receiving from the at least one of the plurality of sensor data sources sensory information representing the sensory data from the physical environment of the source device, identifying a plurality of characteristics of the physical environment of the source device from the received sensory information, sending to a second device media content and the sensory information representing the plurality of characteristics of the physical environment of the source device. Other embodiments are disclosed.

20 Claims, 10 Drawing Sheets



(51) **Int. Cl.**

H04N 21/422	(2011.01)
H04N 21/63	(2011.01)
H04N 21/233	(2011.01)
H04N 21/258	(2011.01)
H04N 21/437	(2011.01)
H04N 21/442	(2011.01)

(52) **U.S. Cl.**

CPC . ***H04N 21/2343*** (2013.01); ***H04N 21/234309*** (2013.01); ***H04N 21/25841*** (2013.01); ***H04N 21/42201*** (2013.01); ***H04N 21/42202*** (2013.01); ***H04N 21/437*** (2013.01); ***H04N 21/442*** (2013.01); ***H04N 21/632*** (2013.01)

(58) **Field of Classification Search**

CPC H04N 21/25841; H04N 21/42201; H04N 21/42202; H04N 21/437; H04N 21/442; H04N 21/632; G06Q 10/10

USPC 715/255, 273, 275

See application file for complete search history.

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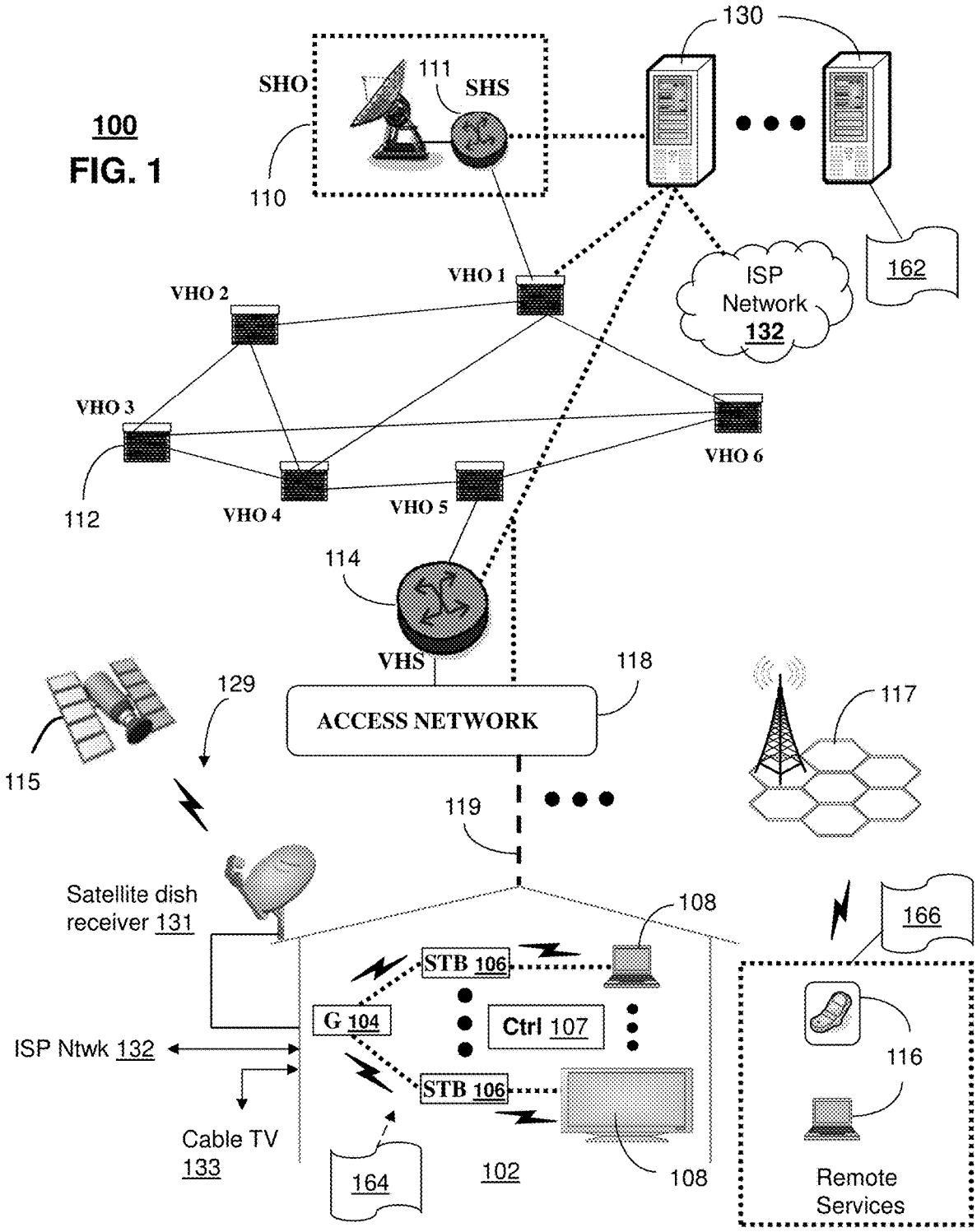
100

FIG. 1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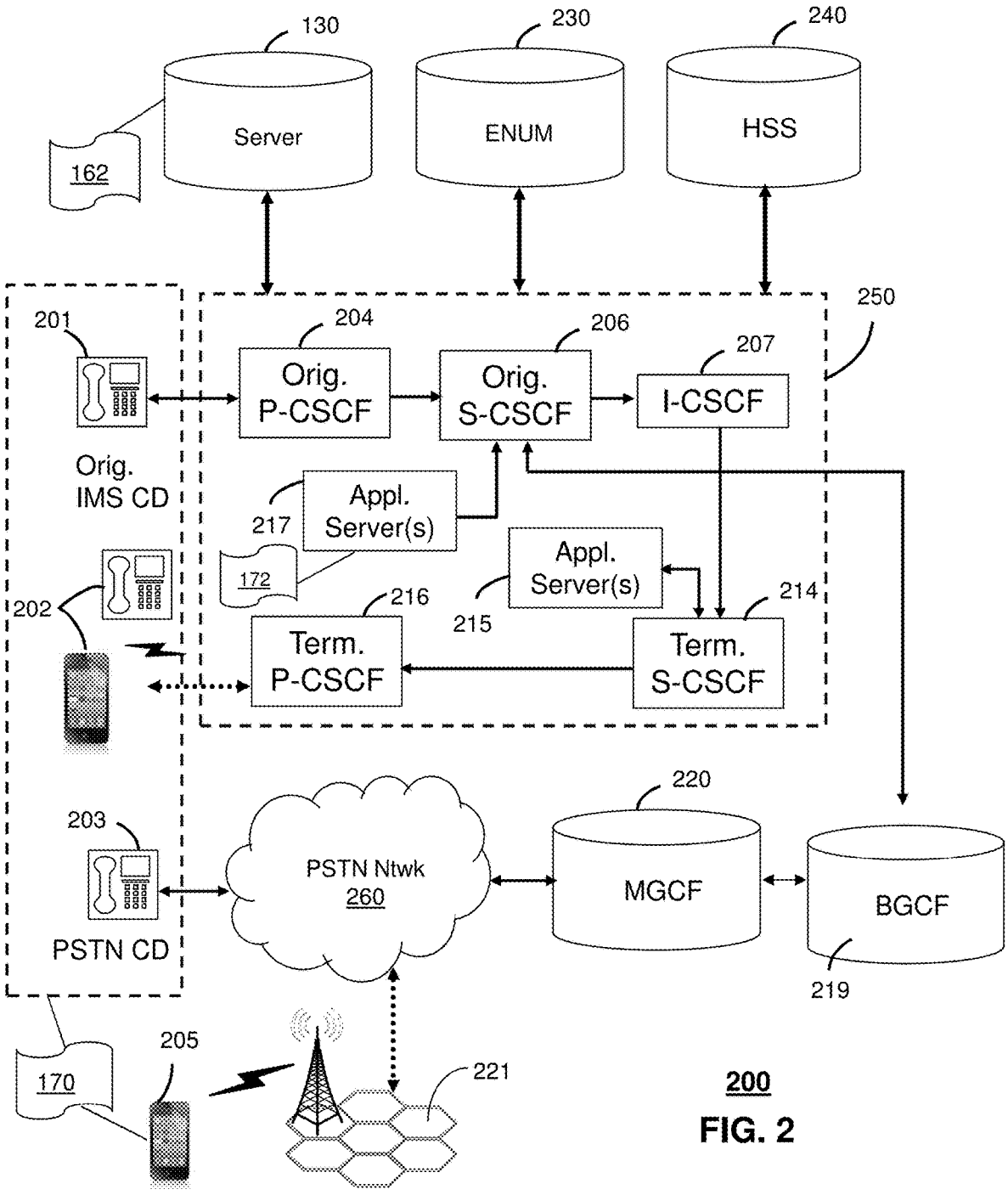
SHO
111
SHS
110
162
ISP
Network
132
VHO 1
VHO 2
VHO 3
VHO 4
VHO 5
VHO 6
112
114
VHS
118
ACCESS NETWORK
129
115
117
119
Satellite dish
receiver 131
108
166
STB 106
G 104
Ctrl 107
ISP Ntwk 132
STB 106
116
Cable TV
133
164
102
108
Remote
Services


130
230
240
Server
ENUM
HSS
162
250
201
204
206
207
Orig.
P-CSCF
Orig.
S-CSCF
I-CSCF
Orig.
IMS CD
217
Appl.
Server(s)
172
Appl.
Server(s)
215
202
216
214
Term.
P-CSCF
Term.
S-CSCF
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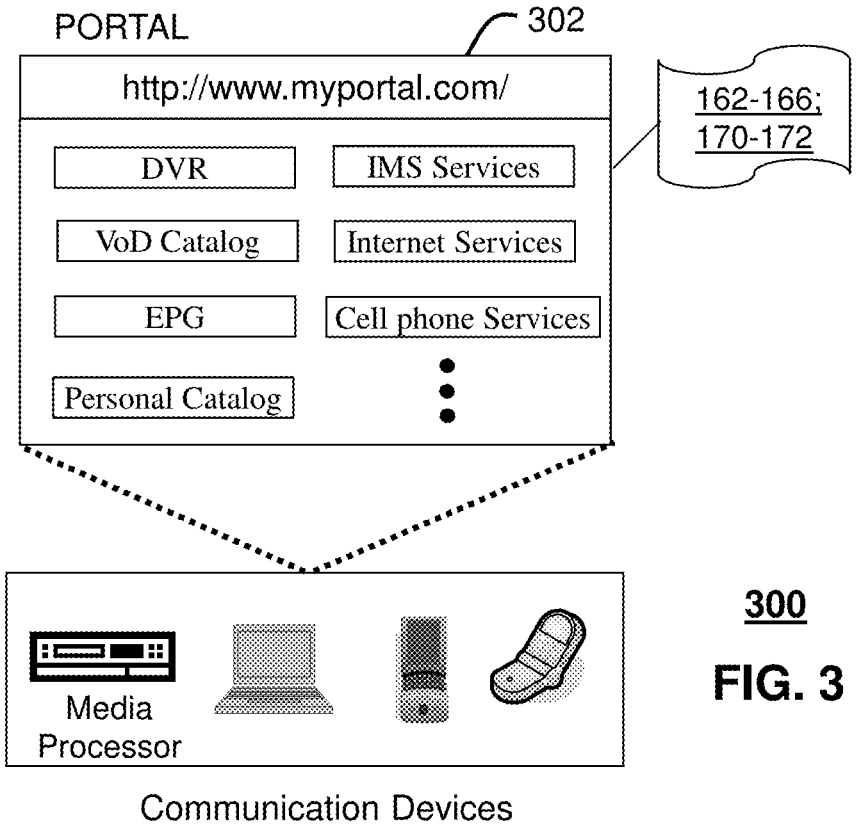
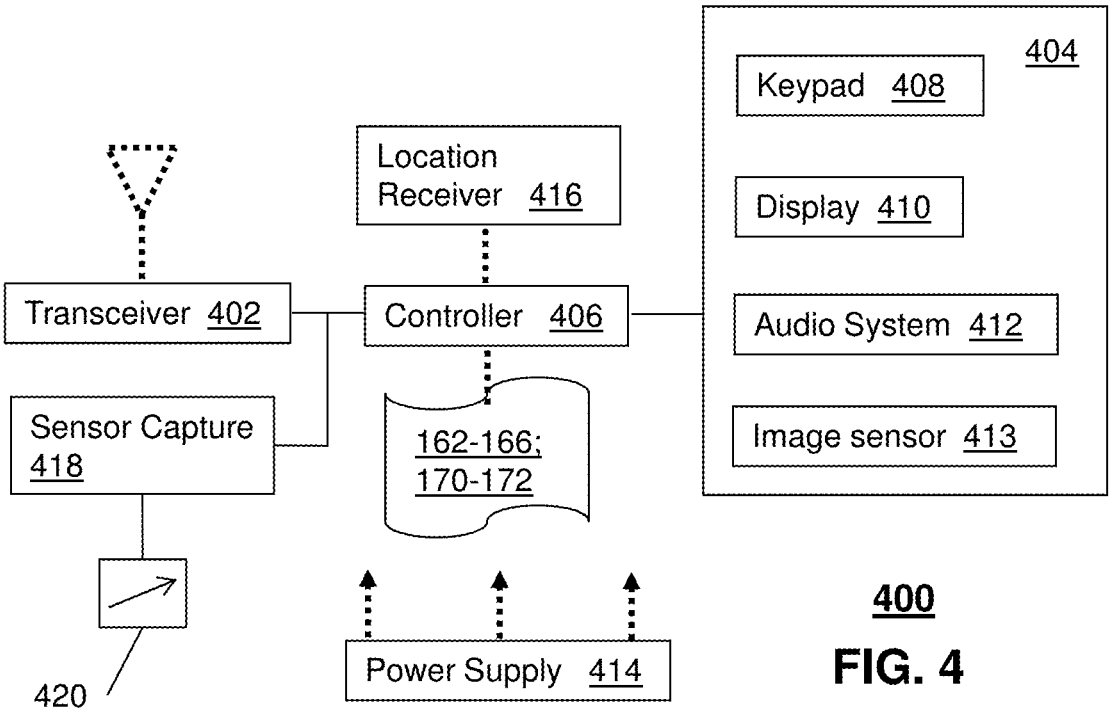
203
PSTN Ntwk
260
MGCF
BGCF
PSTN CD
219
205
170
221
200

FIG. 2



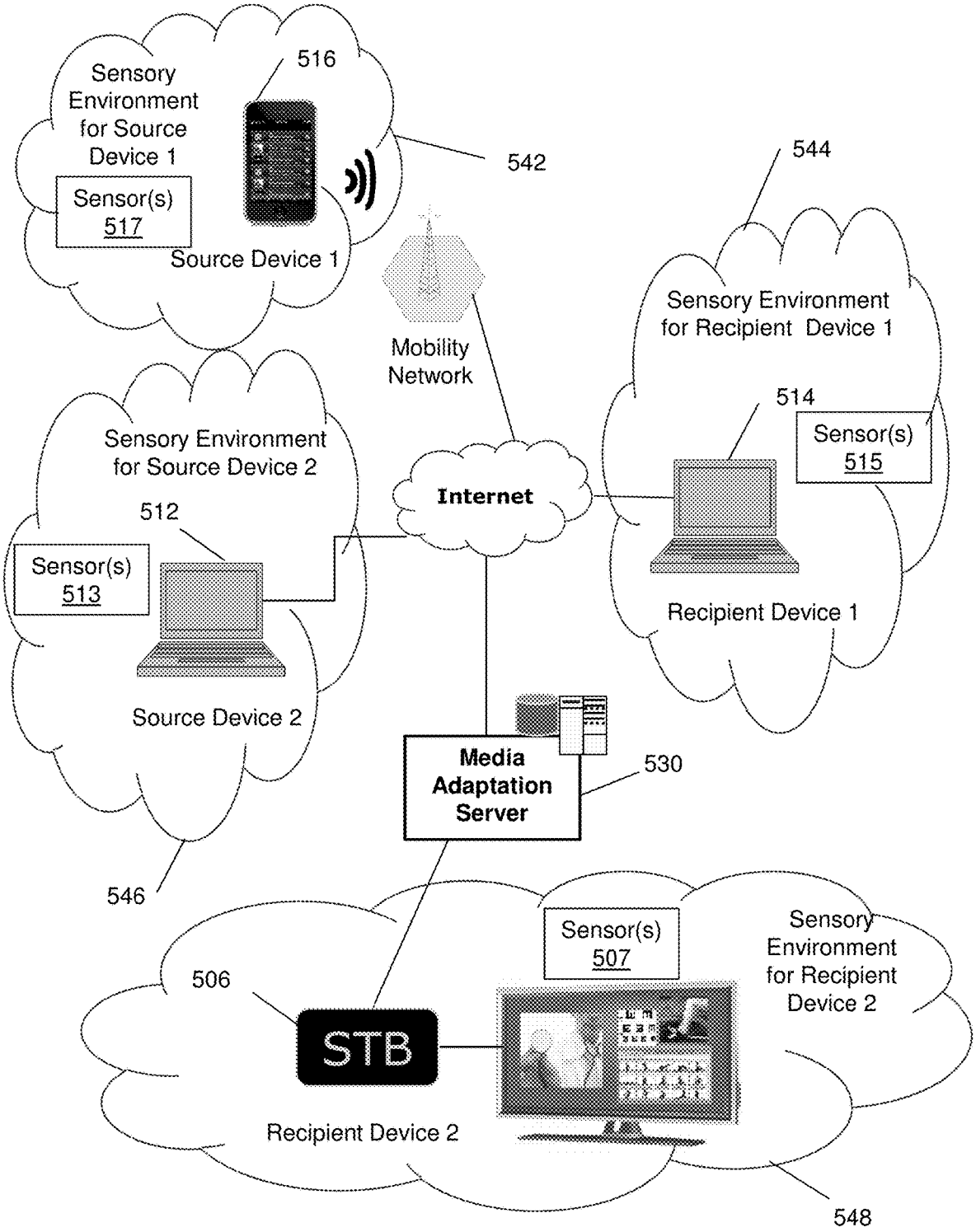
300

FIG. 3



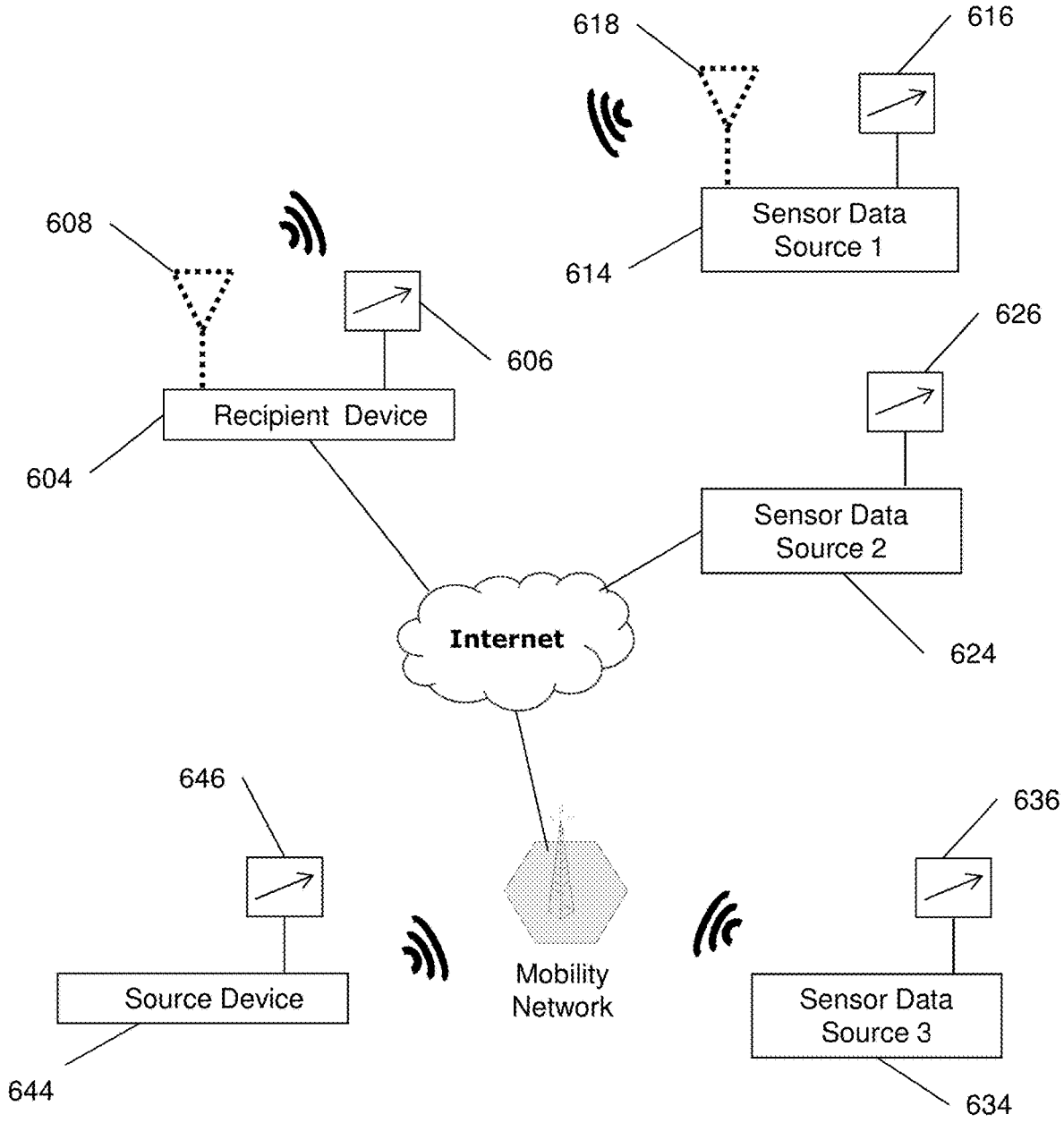
400

FIG. 4


Sensory Environment for Source Device 1
516
Sensor(s) 517
Source Device 1
542
544
Mobility Network
Sensory Environment for Recipient Device 1
514
Sensor(s) 515
Sensory Environment for Source Device 2
Internet
512
Sensor(s) 513
Recipient Device 1
Source Device 2
Media Adaptation Server
530
546
Sensor(s) 507
Sensory Environment for Recipient Device 2
506
STB
Recipient Device 2
548

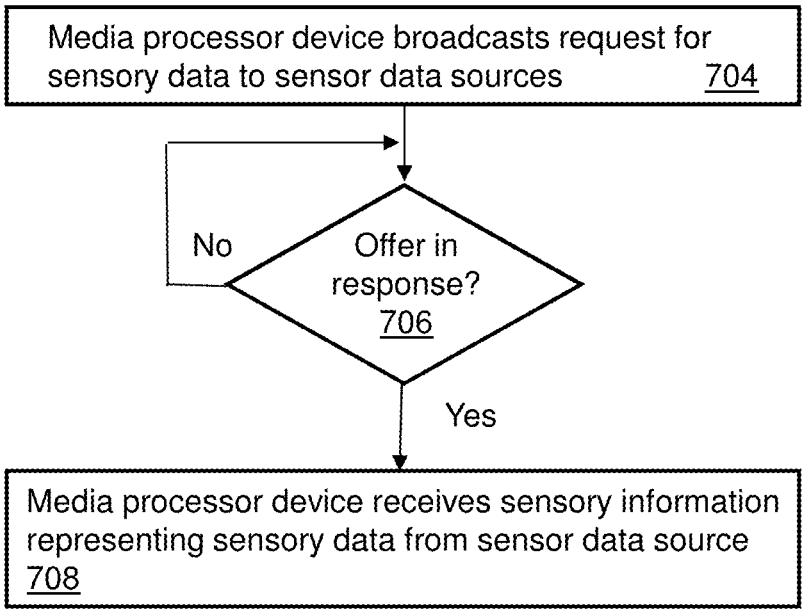
500

FIG. 5


618
616
Sensor Data Source 1
614
608
606
Recipient Device
604
626
Sensor Data Source 2
624
Internet
646
636
Source Device
644
Mobility Network
Sensor Data Source 3
634

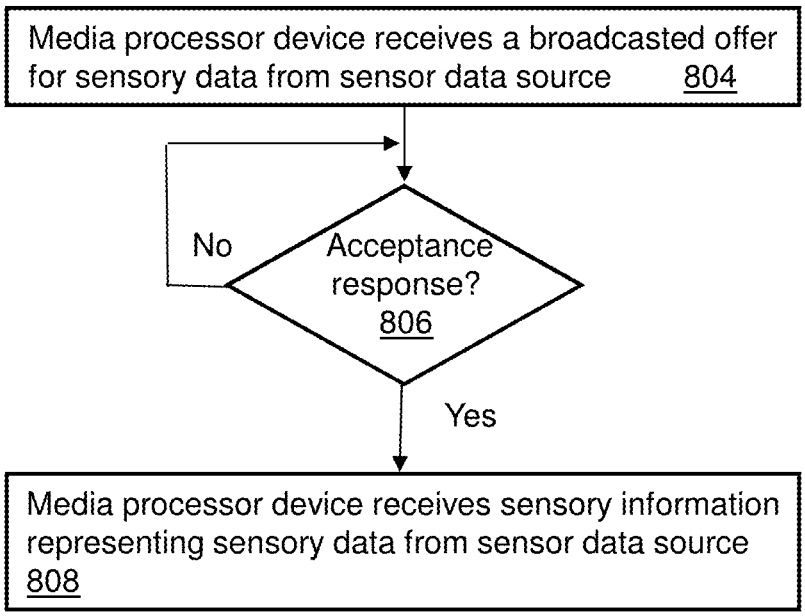
600

FIG. 6



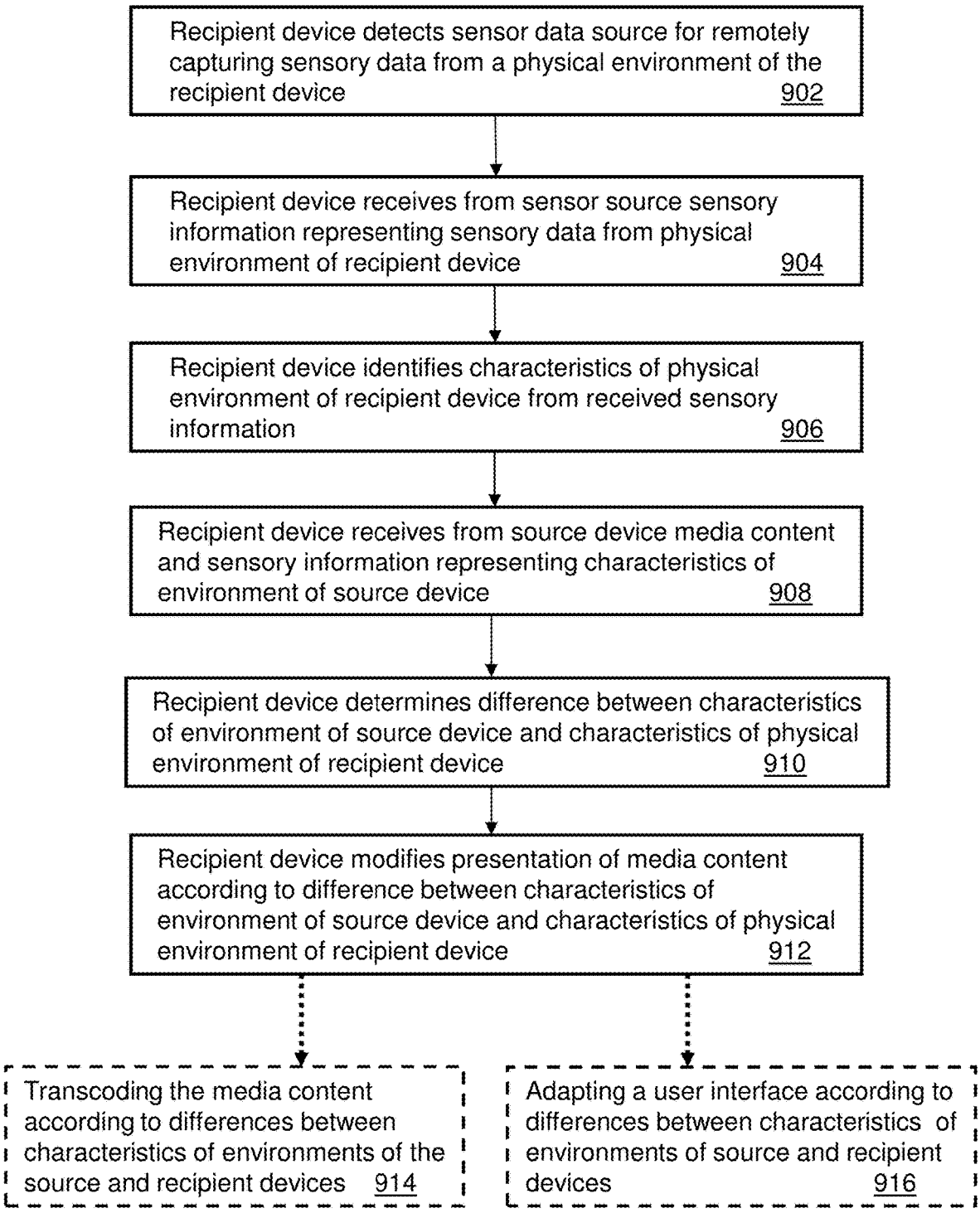
700

FIG. 7



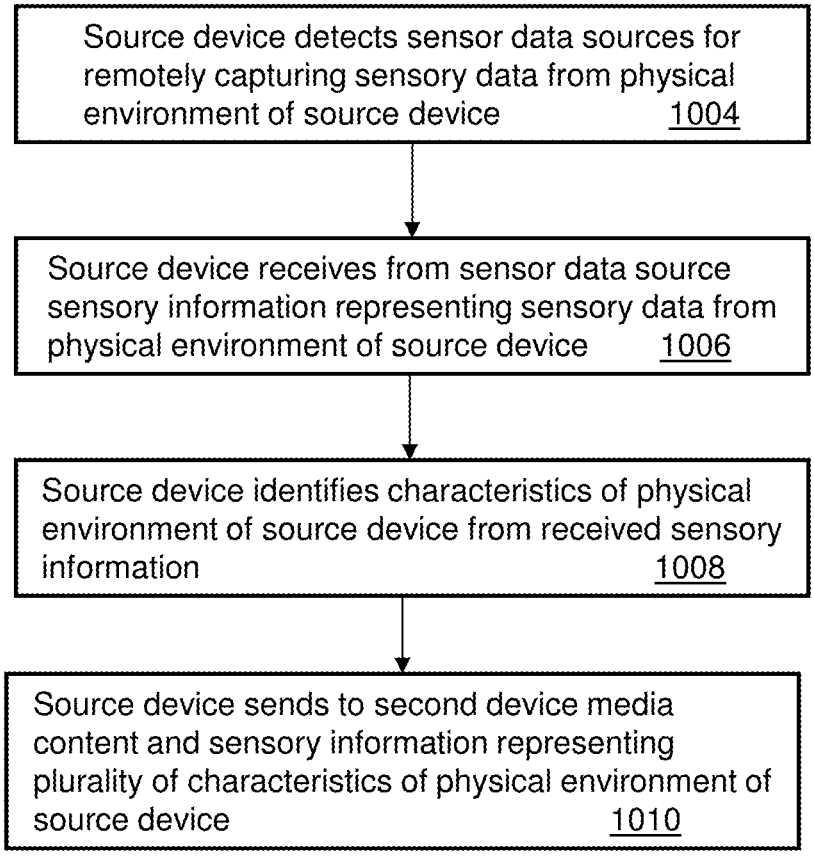
800

FIG. 8


Recipient device detects sensor data source for remotely capturing sensory data from a physical environment of the recipient device 902
Recipient device receives from sensor source sensory information representing sensory data from physical environment of recipient device 904
Recipient device identifies characteristics of physical environment of recipient device from received sensory information 906
Recipient device receives from source device media content and sensory information representing characteristics of environment of source device 908
Recipient device determines difference between characteristics of environment of source device and characteristics of physical environment of recipient device 910
Recipient device modifies presentation of media content according to difference between characteristics of environment of source device and characteristics of physical environment of recipient device 912
Transcoding the media content according to differences between characteristics of environments of the source and recipient devices 914
Adapting a user interface according to differences between characteristics of environments of source and recipient devices 916

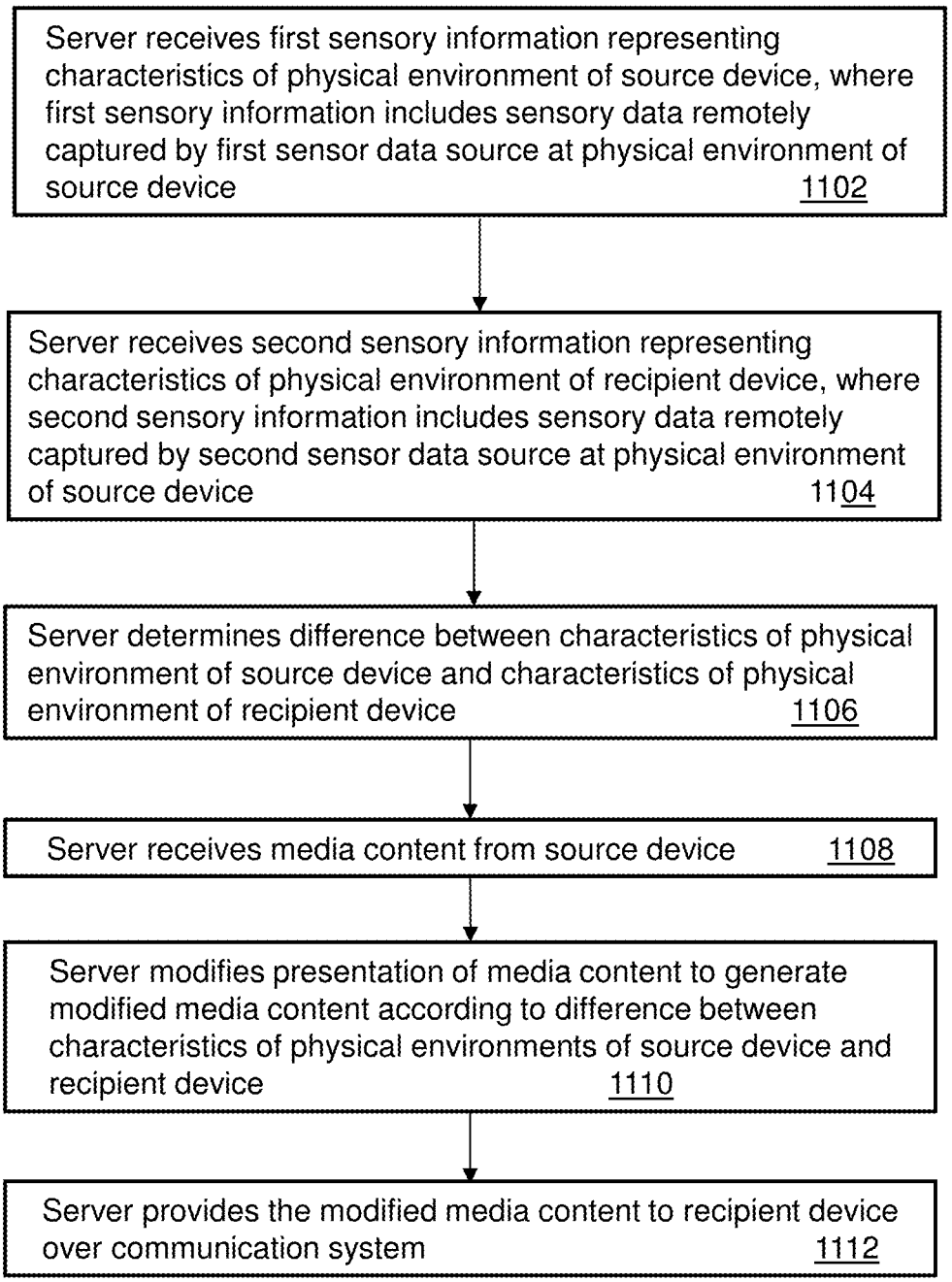
900

FIG. 9


Source device detects sensor data sources for remotely capturing sensory data from physical environment of source device 1004
Source device receives from sensor data source sensory information representing sensory data from physical environment of source device 1006
Source device identifies characteristics of physical environment of source device from received sensory information 1008
Source device sends to second device media content and sensory information representing plurality of characteristics of physical environment of source device 1010

1000

FIG. 10


Server receives first sensory information representing characteristics of physical environment of source device, where first sensory information includes sensory data remotely captured by first sensor data source at physical environment of source device 1102
Server receives second sensory information representing characteristics of physical environment of recipient device, where second sensory information includes sensory data remotely captured by second sensor data source at physical environment of source device 1104
Server determines difference between characteristics of physical environment of source device and characteristics of physical environment of recipient device 1106
Server receives media content from source device 1108
Server modifies presentation of media content to generate modified media content according to difference between characteristics of physical environments of source device and recipient device 1110
Server provides the modified media content to recipient device over communication system 1112

1100

FIG. 11

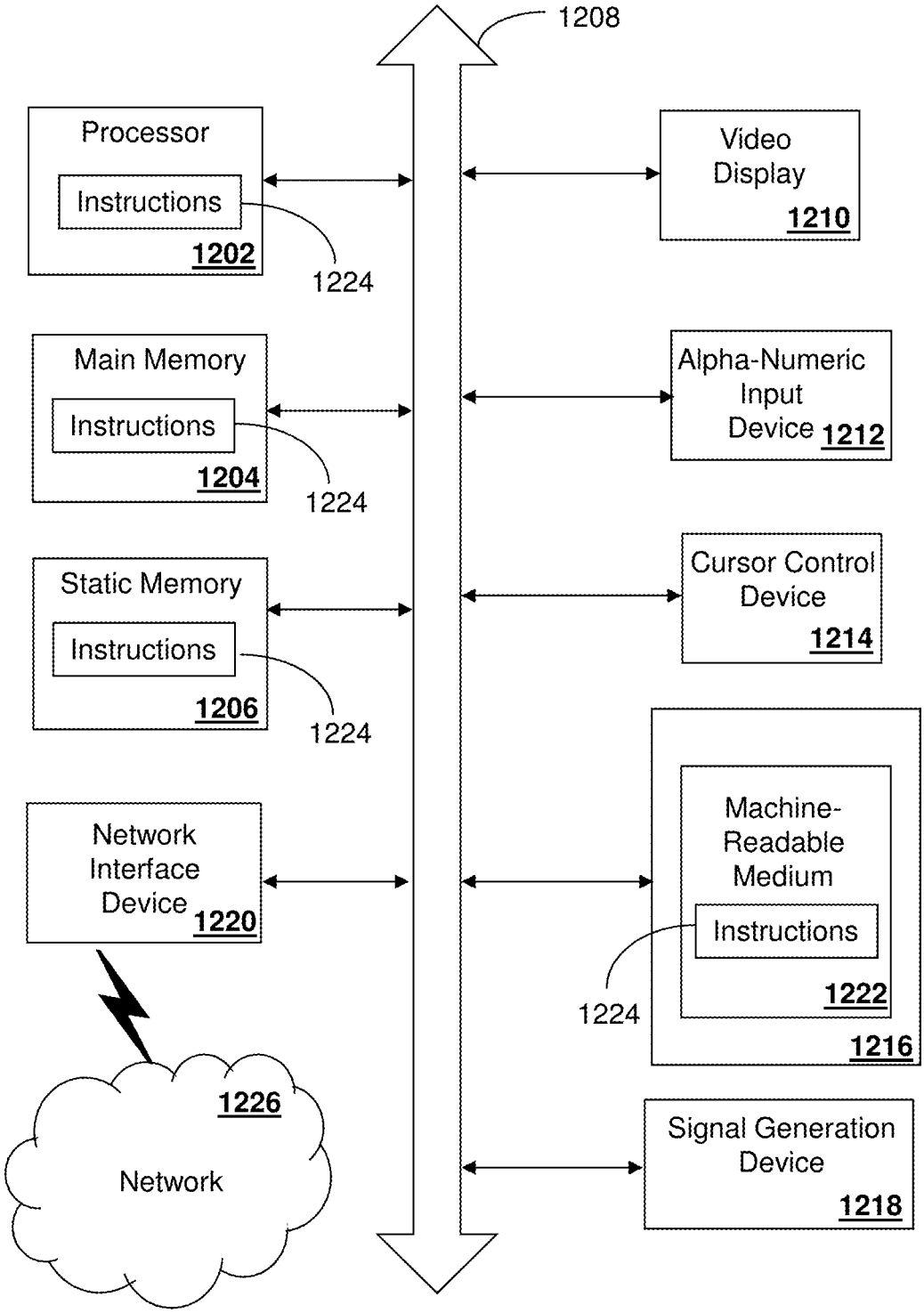

1208
Processor
Instructions
1202
1224
Main Memory
Instructions
1204
1224
Static Memory
Instructions
1206
1224
Network Interface Device 1220
1226
Network
Video Display 1210
Alpha-Numeric Input Device 1212
Cursor Control Device 1214
Machine-Readable Medium
Instructions
1222
1224
1216
Signal Generation Device 1218
1200

FIG. 12

METHOD AND APPARATUS FOR MULTI-EXPERIENCE TRANSLATION OF MEDIA CONTENT WITH SENSOR SHARING

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a divisional application of U.S. application Ser. No. 13/208,037, filed Aug. 11, 2011, which is incorporated herein by reference in its entirety.

FIELD OF THE DISCLOSURE

The present disclosure relates generally to media content and more specifically to a multi-experience translation of media content.

BACKGROUND

Media content is generally experienced by consumers via devices such as computers, televisions, radios, and mobile electronics. Media content is frequently delivered by service providers, who send media content, such as television programs, radio, and video, directly to consumers for enjoyment at their physical location. Service providers also often provide access to the internet and to internet-based media content, such as websites, games, social networking, and virtual-reality applications. Consumer media content experiences can be affected by their sensory environment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1-2** depict illustrative embodiments of communication systems that provide media services;

FIG. **3** depicts an illustrative embodiment of a web portal for interacting with the communication systems of FIGS. **1-2**;

FIG. **4** depicts an illustrative embodiment of a communication device utilized in the communication systems of FIGS. **1-2**;

FIGS. **5-6** depict an illustrative embodiment of a system;

FIGS. **7-11** depict an illustrative embodiment of a method operating in portions of the systems described in FIGS. **1-5**; and

FIG. **12** is a diagrammatic representation of a machine in the form of a computer system within which a set of instructions, when executed, may cause the machine to perform any one or more of the methods discussed herein.

DETAILED DESCRIPTION

The present disclosure is related to U.S. application Ser. No. 13/207,927, filed Aug. 11, 2011, by Basso et al., entitled "Method and Apparatus for Controlling Multi-Experience Translation of Media Content;" U.S. application Ser. No. 13/185,487, filed Jul. 18, 2011, by Basso et al., entitled "Method and Apparatus for Multi-Experience Adaptation of Media Content;" and U.S. application Ser. No. 13/185,493, filed Jul. 18, 2011, by Basso et al., entitled "Method and Apparatus for Multi-Experience Metadata Translation of Media Content with Metadata," which are incorporated herein by reference in their entirety.

The present disclosure describes, among other things, illustrative embodiments for adaptation of media content in accordance with a consumer sensory environment. In one embodiment, differences between sensory environments between a source device and a recipient device are used for media content adaptation. Other embodiments are contemplated by the present disclosure.

One embodiment of the present disclosure includes a recipient device having a memory and a processor. The processor can be operable to detect at least one of a plurality of sensor data sources for capturing sensory data from a physical environment of the recipient device. The processor can also be operable to receive from the at least one of the plurality of sensor data sources sensory information representing the sensory data from the physical environment of the recipient device. The processor can further be operable to identify a plurality of characteristics of the physical environment of the recipient device from the received sensory information. The processor can be operable to receive from a source device media content and sensory information representing a plurality of characteristics of an environment of the source device. The processor can also be operable to determine at least one difference between the plurality of characteristics of the environment of the source device and the plurality of characteristics of the physical environment of the recipient device. The processor can further be operable to modify a presentation of the media content according to the at least one difference between the plurality of characteristics of the environment of the source device and the plurality of characteristics of the physical environment of the recipient device.

One embodiment of the present disclosure includes a source device having a memory and a processor. The processor can be operable to detect at least one of a plurality of sensor data sources for capturing sensory data from a physical environment of the source device. The processor can also be operable to receive from the at least one of the plurality of sensor data sources sensory information representing the sensory data from the physical environment of the source device. The processor can also be operable to identify a plurality of characteristics of the physical environment of the source device from the received sensory information. The processor can further be operable to send to a second device media content and the sensory information representing the plurality of characteristics of the physical environment of the source device.

One embodiment of the present disclosure includes a device having a memory and a processor. The processor can be operable to receive first sensory information representing a plurality of characteristics of a physical environment of a source device. The first sensory information can include sensory data captured by a first sensor data source at the physical environment of the source device. The processor can also be operable to receive second sensory information representing a plurality of characteristics of a physical environment of a recipient device. The second sensory information can include sensory data captured by a second sensor data source at the physical environment of the source device. The processor can further be operable to determine at least one difference between the plurality of characteristics of the physical environment of the source device and the plurality of characteristics of the physical environment of the recipient device. The processor can be operable to receive media content from the source device. The processor can further be operable to modify a presentation of the media content to generate modified media content according to the at least one difference between the plurality of characteristics of the physical environment of the source device and the plurality of characteristics of the physical environment of the recipient device. The processor can be operable to provide the modified media content to the recipient device over a communication system.

FIG. **1** depicts an illustrative embodiment of a first communication system **100** for delivering media content. The novel communication system **100** can collect sensory data characterizing physical environments of devices, such as media processors. The communication system **100** can detect sensor data sources for capturing sensory data from physical environments of devices. The communication system **100** can receive from the sensor data sources sensory information representing the sensory data for the devices. The communication system can compare the sensory information for two different devices and can modify a presentation of media content according to detected differences.

The communication system **100** can represent an Internet Protocol Television (IPTV) media system. The IPTV media system can include a super head-end office (SHO) **110** with at least one super headend office server (SHS) **111** which receives media content from satellite and/or terrestrial communication systems. In the present context, media content can represent, for example, audio content, moving image content such as 2D or 3D videos, video games, virtual reality content, still image content, and combinations thereof. The SHS server **111** can forward packets associated with the media content to one or more video head-end servers (VHS) **114** via a network of video head-end offices (VHO) **112** according to a common multicast communication protocol.

The VHS **114** can distribute multimedia broadcast content via an access network **118** to commercial and/or residential buildings **102** housing a gateway **104** (such as a residential or commercial gateway). The access network **118** can represent a group of digital subscriber line access multiplexers (DSLAMs) located in a central office or a service area interface that provide broadband services over fiber optical links or copper twisted pairs **119** to buildings **102**. The gateway **104** can use common communication technology to distribute broadcast signals to media processors **106** such as Set-Top Boxes (STBs) which in turn present broadcast channels to media devices **108** such as computers or television sets managed in some instances by a media controller **107** (such as an infrared or RF remote control).

The gateway **104**, the media processors **106**, and media devices **108** can utilize tethered communication technologies (such as coaxial, powerline or phone line wiring) or can operate over a wireless access protocol such as Wireless Fidelity (Wi-Fi), Bluetooth, Zigbee, or other present or next generation local or personal area wireless network technologies. By way of these interfaces, unicast communications can also be invoked between the media processors **106** and subsystems of the IPTV media system for services such as video-on-demand (VoD), browsing an electronic programming guide (EPG), or other infrastructure services.

A satellite broadcast television system **129** can be used also in the media system of FIG. **1**. The satellite broadcast television system can be overlaid, operably coupled with, or replace the IPTV system as another representative embodiment of communication system **100**. In this embodiment, signals transmitted by a satellite **115** carrying media content can be received by a satellite dish receiver **131** coupled to the building **102**. Modulated signals received by the satellite dish receiver **131** can be transferred to the media processors **106** for demodulating, decoding, encoding, and/or distributing broadcast channels to the media devices **108**. The media processors **106** can be equipped with a broadband port to the ISP network **132** to enable interactive services such as VoD and EPG as described above.

In yet another embodiment, an analog or digital cable broadcast distribution system such as cable TV system **133** can be overlaid, operably coupled with, or replace the IPTV system and/or the satellite TV system as another representative embodiment of communication system **100**. In this embodiment, the cable TV system **133** can also provide Internet, telephony, and interactive media services.

The present disclosure can apply to other present or next generation over-the-air and/or landline media content services system.

Some of the network elements of the IPTV media system can be coupled to one or more computing devices **130**, a portion of which can operate as a web server for providing web portal services over an Internet Service Provider (ISP) network **132** to wireline media devices **108** or portable communication devices **116**.

Multiple forms of media services can be offered to media devices over landline technologies such as those described above. Additionally, media services can be offered to media devices by way of a wireless access base station **117** operating according to common wireless access protocols such as Global System for Mobile or GSM, Code Division Multiple Access or CDMA, Time Division Multiple Access or TDMA, Universal Mobile Telecommunications or UMTS, World interoperability for Microwave or WiMAX, Software Defined Radio or SDR, Long Term Evolution or LTE, and so on. Other present and next generation wide area wireless network technologies are contemplated by the present disclosure.

Communication system **100** can also provide for all or a portion of the computing devices **130** to function as a media content adaptation server (herein referred to as server **130**). The server **130** can use common computing and communication technology to perform function **162**, which includes among other things, modification of media content in accordance with a consumer's environment. The server **130** can be used to receive media content from a source device, such as one of the media processors **106**, media devices **108**, or portable communication devices **116**. The server **130** can also be used to retrieve sensory information from an environment of a recipient device, such as another of the media processors **106**, media devices **108**, or portable communication devices **116**. The server **130** can further be used to identify characteristics of the environment of the recipient device corresponding to the sensory information from the environment of the recipient device.

The server **130** can be used to determine differences between the characteristics of the environments of the source and recipient devices. The server **130** can also be used to modify a presentation of media content according to the differences between the characteristics of the environments of the source and recipient devices. The server **130** can further be used to provide the modified media content to the recipient device over the communication system **100**. The media processors **106** and portable communication devices **116** can be adapted with software functions **164** and **166**, respectively, to further utilize the services of the server **130**. For example, the media processors **106** and portable communication devices **116** can be adapted to execute software functions **164** and **166**, respectively, to collect and report sensory data representing characteristics of the environments of the media processors **106** and portable communication devices **116**, respectively.

FIG. **2** depicts an illustrative embodiment of a communication system **200** employing IP Multimedia Subsystem (IMS) network architecture to facilitate the combined services of circuit-switched and packet-switched systems. The communication system **200** can be overlaid or operably coupled with communication system **100** as another representative embodiment of communication system **100**.

Communication system **200** can comprise a Home Subscriber Server (HSS) **240**, a tElephone NUmber Mapping (ENUM) server **230**, and other common network elements of an IMS network **250**. The IMS network **250** can establish communications between IMS-compliant communication devices (CDs) **201**, **202**, Public Switched Telephone Network (PSTN) CDs **203**, **205**, and combinations thereof by way of a Media Gateway Control Function (MGCF) **220** coupled to a PSTN network **260**. The MGCF **220** need not be used when a communication session involves IMS CD to IMS CD communications. A communication session involving at least one PSTN CD may utilize the MGCF **220**.

IMS CDs **201**, **202** can register with the IMS network **250** by contacting a Proxy Call Session Control Function (P-CSCF) which communicates with an interrogating CSCF (I-CSCF), which in turn, communicates with a Serving CSCF (S-CSCF) to register the CDs with the HSS **240**. To initiate a communication session between CDs, an originating IMS CD **201** can submit a Session Initiation Protocol (SIP INVITE) message to an originating P-CSCF **204** which communicates with a corresponding originating S-CSCF **206**. The originating S-CSCF **206** can submit the SIP INVITE message to one or more application servers (ASs) **217** that can provide a variety of services to IMS subscribers.

For example, the application servers **217** can be used to perform originating call feature treatment functions on the calling party number received by the originating S-CSCF **206** in the SIP INVITE message. Originating treatment functions can include determining whether the calling party number has international calling services, call ID blocking, calling name blocking, 7-digit dialing, and/or is requesting special telephony features (e.g., *72 forward calls, *73 cancel call forwarding, *67 for caller ID blocking, and so on). Based on initial filter criteria (iFCs) in a subscriber profile associated with a CD, one or more application servers may be invoked to provide various call originating feature services.

Additionally, the originating S-CSCF **206** can submit queries to the ENUM system **230** to translate an E.164 telephone number in the SIP INVITE message to a SIP Uniform Resource Identifier (URI) if the terminating communication device is IMS-compliant. The SIP URI can be used by an Interrogating CSCF (I-CSCF) **207** to submit a query to the HSS **240** to identify a terminating S-CSCF **214** associated with a terminating IMS CD such as reference **202**. Once identified, the I-CSCF **207** can submit the SIP INVITE message to the terminating S-CSCF **214**. The terminating S-CSCF **214** can then identify a terminating P-CSCF **216** associated with the terminating CD **202**. The P-CSCF **216** may then signal the CD **202** to establish Voice over Internet Protocol (VoIP) communication services, thereby enabling the calling and called parties to engage in voice and/or data communications. Based on the iFCs in the subscriber profile, one or more application servers may be invoked to provide various call terminating feature services, such as call forwarding, do not disturb, music tones, simultaneous ringing, sequential ringing, etc.

In some instances the aforementioned communication process is symmetrical. Accordingly, the terms "originating" and "terminating" in FIG. **2** may be interchangeable. It is further noted that communication system **200** can be adapted to support video conferencing. In addition, communication system **200** can be adapted to provide the IMS CDs **201**, **202** with the multimedia and Internet services of communication system **100** of FIG. **1**. It is further contemplated that the CDs of FIG. **2** can operate as wireline or wireless devices. For example, the CDs of FIG. **2** can be communicatively coupled to a cellular base station **117** such as shown in FIG. **1**, a femtocell (not shown), a Wi-Fi router, a DECT base unit, or another suitable wireless access unit to establish communications with the IMS network **250** of FIG. **2**.

If the terminating communication device is instead a PSTN CD such as CD **203** or CD **205** (in instances where the cellular phone only supports circuit-switched voice communications), the ENUM system **230** can respond with an unsuccessful address resolution which can cause the originating S-CSCF **206** to forward the call to the MGCF **220** via a Breakout Gateway Control Function (BGCF) **219**. The MGCF **220** can then initiate the call to the terminating PSTN CD over the PSTN network **260** to enable the calling and called parties to engage in voice and/or data communications.

It is further appreciated that the CDs of FIG. **2** can operate as wireline or wireless devices. Although not shown, the CDs of FIG. **2** can be communicatively coupled to a cellular base station **221**, a femtocell, a WiFi router, a DECT base unit, or another suitable wireless access unit to establish communications with the IMS network **250** of FIG. **2**. The cellular access base station **121** can operate according to common wireless access protocols such as Global System for Mobile (GSM), Code Division Multiple Access (CDMA), Time Division Multiple Access (TDMA), Universal Mobile Telecommunications (UMTS), World interoperability for Microwave (WiMAX), Software Defined Radio (SDR), Long Term Evolution (LTE), and so on. Other present and next generation wireless network technologies are contemplated by the present disclosure. Accordingly, multiple wireline and wireless communication technologies are contemplated for the CDs of FIG. **2**.

It is further contemplated that cellular phones supporting LTE can support packet-switched voice and packet-switched data communications and thus may operate as IMS-compliant mobile devices. In this embodiment, the cellular base station **221** may communicate directly with the IMS network **250**.

Communication system **200** can include or otherwise be coupled with server **130** of FIG. **1** for purposes similar to those described above. It is further contemplated by the present disclosure that the server **130** can perform the function **162** and thereby provide a media content adaptation application for subscribers associated with CDs **201**, **202**, **203**, and **205**. CDs **201**, **202**, **203**, and **205** can be adapted with software to perform function **170** to utilize and integrate with the multi-experience adaptation application performed by the server **130**. It is further contemplated that the server **130** can be an integral part of the application server(s) **217**, where the application server(s) **217** performs function **172**, which can be substantially similar to function **162** and adapted to the operation of the IMS network **250**.

FIG. **3** depicts an illustrative embodiment of a web portal **302** which can be hosted by server applications operating from the computing devices **130** of the communication system **100** illustrated in FIG. **1**. The web portal **302** can be used for managing services of communication systems **100**-**200**. A web page of the web portal **302** can be accessed by a Uniform Resource Locator (URL) with an Internet browser such as Microsoft's Internet Explorer™, Mozilla's Firefox™, Apple's Safari™, or Google's Chrome™ using an Internet-capable communication device such as those described in FIGS. **1**-**2**. The web portal **302** can be configured, for example, to access a media processor **106** and services managed thereby such as a Digital Video Recorder (DVR), a Video on Demand (VoD) catalog, an Electronic

Programming Guide (EPG), or a personal catalog (such as personal videos, pictures, audio recordings, etc.) stored at the media processor **106**. The web portal **302** can also be used for provisioning IMS services described earlier, provisioning Internet services, provisioning cellular phone services, and so on.

It is contemplated by the present disclosure that the web portal **302** can further be utilized to manage and provision software applications **162-172** of the devices of FIGS. **1-2**, respectively, as described earlier.

FIG. **4** depicts an exemplary embodiment of a communication device **400**. Communication device **400** can serve in whole or in part as an illustrative embodiment of the devices depicted in FIGS. **1-2**. The communication device **400** can comprise a wireline and/or wireless transceiver **402** (herein transceiver **402**), a user interface (UI) **404**, a power supply **414**, a location receiver **416**, and a controller **406** for managing operations thereof. The transceiver **402** can support short-range or long-range wireless access technologies such as Bluetooth, Wi-Fi, Digital Enhanced Cordless Telecommunications (DECT), or cellular communication technologies, just to mention a few. Cellular technologies can include, for example, CDMA-1X, UMTS/HSDPA, GSM/GPRS, TDMA/EDGE, EV/DO, WiMAX, SDR, LTE, as well as other next generation wireless communication technologies as they arise. The transceiver **402** can also be adapted to support circuit-switched wireline access technologies (such as PSTN), packet-switched wireline access technologies (such as TCPIP, VOID, etc.), and combinations thereof.

The UI **404** can include a depressible or touch-sensitive keypad **408** with a navigation mechanism such as a roller ball, a joystick, a mouse, or a navigation disk for manipulating operations of the communication device **400**. The keypad **408** can be an integral part of a housing assembly of the communication device **400** or an independent device operably coupled thereto by a tethered wireline interface (such as a USB cable) or a wireless interface supporting for example Bluetooth. The keypad **408** can represent a numeric keypad commonly used by phones, and/or a Qwerty keypad with alphanumeric keys. The UI **404** can further include a display **410** such as monochrome or color LCD (Liquid Crystal Display), OLED (Organic Light Emitting Diode) or other suitable display technology for conveying images to an end user of the communication device **400**. In an embodiment where the display **410** is touch-sensitive, a portion or all of the keypad **408** can be presented by way of the display **410** with navigation features.

The UI **404** can also include an audio system **412** that utilizes common audio technology for conveying low volume audio (such as audio heard only in the proximity of a human ear) and high volume audio (such as speakerphone for hands free operation). The audio system **412** can further include a microphone for receiving audible signals of an end user. The audio system **412** can also be used for voice recognition applications. The UI **404** can further include an image sensor **413** such as a charged coupled device (CCD) camera for capturing still or moving images.

The power supply **414** can utilize common power management technologies such as replaceable and rechargeable batteries, supply regulation technologies, and charging system technologies for supplying energy to the components of the communication device **400** to facilitate long-range or short-range portable applications. The location receiver **416** can utilize common location technology such as a global positioning system (GPS) receiver capable of assisted GPS for identifying a location of the communication device **400** based on signals generated by a constellation of GPS satellites, thereby facilitating common location services such as navigation.

The communication device **400** can use the transceiver **402** to also determine a proximity to a cellular, Wi-Fi, Bluetooth, or other wireless access points by common sensing techniques such as utilizing a received signal strength indicator (RSSI) and/or a signal time of arrival (TOA) or time of flight (TOF). The controller **406** can utilize computing technologies such as a microprocessor, a digital signal processor (DSP), and/or a video processor with associated storage memory such as Flash, ROM, RAM, SRAM, DRAM or other storage technologies. The communication device **400** can be adapted to use the transceiver **402** to communicate with a sensor data source for capturing sensory data for the communication device **400**. In one embodiment, the transceiver **402** can detect a sensor data source by detecting the presence of a radio frequency identification antenna in the sensor data source. In another example, the transceiver **402** can communicate with the sensor data source by a cellular network or by a radio frequency signaling.

The communication device **400** can also include a sensor capture function **418**. The sensor capture function **418** can be adapted to measure or sample data from a sensor **420** coupled to the communication device **400**. In one embodiment, the sensor capture block can use an analog-to-digital convertor to sample values at the sensor **420**.

The communication device **400** can be adapted to perform the functions of the media processor **106**, the media devices **108**, or the portable communication devices **116** of FIG. **1**, as well as the IMS CDs **201-202** and PSTN CDs **203-205** of FIG. **2**. It will be appreciated that the communication device **400** can also represent other common devices that can operate in communication systems **100-200** of FIGS. **1-2** such as a gaming console and a media player.

Illustrative embodiments of methods that can operate in portions of the communication device of FIG. **4** are described below.

FIG. **5** depicts an illustrative embodiment of a system **500** for adaptation of media content in accordance with a consumer sensory environment. System **500** can be overlaid or operably coupled to communication systems **100-200** as another representative embodiment of communication systems **100-200**. System **500** can include a server **530** in communication with media processors **506** (such as set-top boxes), computing devices **512** and **514** (such as a laptop computer, tablet, etc.), and wireless communication devices **516** (such as mobile phones, smart phones, etc.). The mobile devices **516** can be communicatively coupled to the server **530** by way of a mobility network coupled to the Internet or other communication means. The computing devices **512** can also be communicatively coupled to the server **530** by way of the Internet or other communication means.

The server **530** can be capable of modifying media content in accordance with a consumer's sensory environment. The server **530** can be used to receive media content from a first source device **516**. The media content from the first source device **516** can include metadata corresponding to a digital representation of a sensory environment **542** of the first source device **516**. The server **530** can further be used to receive a digital representation of an environment **544** of a first recipient device **514** corresponding to a plurality of sensory information from the environment of the first recipient device **514**. The server **530** can be used to determine differences between the digital representations of the environments **542** and **544** of the first source device **516**

and the first recipient device **514**. The server **530** can further be used to modify a presentation of the media content according to the differences between the digital representations of the environments **542** and **544** of the first source device **516** and the first recipient device **514**. The server **530** can further be used to provide the modified media content to the first recipient device **514** over the communication system **100**.

In one embodiment, the first source device **516** can be a wireless or mobile communications device coupled to the communications system **100** through a mobility network. The first recipient device **514** can be a computing device. In another example, a second source device **512** can be a computing device operating in a sensory environment **546**, while a second recipient device **506** can be a media processor, such as a set-top box, that presents the media content on a display device, operating in a sensory environment **548**.

Each of environments **542-548** can comprise sensors **507**, **513**, **515** and **517** to provide server **530** sensor data. The sensors can be virtual or physical. In an embodiment where the sensors **507**, **513**, **515** and **517** are physical sensors, these sensors can utilize technology that provides the server **530** sensory information that includes without limitation temperature, weather, lighting, color, images, video, audio, location information, time, season of the year, aroma, and type of establishment from which the source or recipient device is operating. Virtual sensors can be an integral part of a virtual application operating in the source or recipient devices. A virtual application in the present context can represent a video game, virtual game such as Second Life™, an application including avatars, or a social media application. The virtual sensors can also provide the server **530** sensory information such as temperature, weather, lighting, color, images, video, audio, location information, time, season of the year, aroma, and type of establishment presented by the virtual application. Other forms of sensory data such a motion data (velocity, acceleration, etc.), orientation data (e.g., compass information) and other forms of virtual applications are contemplated by the present disclosure.

In one embodiment, the sensors **507**, **513**, **515**, and **517** can be coupled to the source and recipient devices **506**, **512**, **514**, and **516**. In this case, the source and recipient devices **506**, **512**, **514**, and **516** can be adapted to capture sensory data directly from the sensors **507**, **513**, **515**, and **517**. In another example, the sensors **507**, **513**, **515**, and **517** can be monitored by other devices, called sensor data sources. The sensory data for the sensor environments **542**, **544**, **546**, and **548** can be captured by devices operating in the sensory environments **542**, **544**, **546**, and **548**. The sensory data captured by the sensor data sources can be transferred to the source and recipient devices **506**, **512**, **514**, and **516**. The sensor data sources are further explained in FIG. **6**.

FIG. **6** depicts an illustrative embodiment of a system **600** for collecting sensory data from sense sources operating in the sensory environment of the source and recipient devices in accordance with a consumer sensory environment. System **600** can be overlaid or operably coupled to communication systems **100-200** as another representative embodiment of communication systems **100-200** or a portion of communication systems **100-200**. It should be understood, for purposes of this illustration, that the source and recipient devices **644** and **604** are interchangeable, such that the source device **644** and the recipient device **604** can each capture or collect sensory data from the environment by way of similar capabilities as herein described.

The source and recipient devices **644** and **604** can capture sensory data from their respective locations by direct or indirect means. The source and recipient devices **644** and **604** can be directly coupled to sensors **646** and **606**. The source and recipient devices **644** and **604** can be adapted to measure or sample data from sensors **646** and **604**. In one embodiment, the recipient device **604** can use an analog-to-digital convertor to sample values at the sensor **420**. In one embodiment, the sensor **606** can be a smart device such that sensory data can be captured by the recipient device via a digital communication link with the sensor. These sensors can utilize technology that provides the source and recipient devices **644** and **604** sensory information that includes without limitation temperature, weather, lighting, color, images, video, audio, location information, time, season of the year, aroma, and type of establishment from which the source or recipient device is operating.

The source and recipient devices **644** and **604** can collect sensory data from their environment, by indirect means, through communication with a sensor data source. Sensor data sources **614**, **624**, and **634** can be single-purpose or multi-purpose devices. For example, the recipient device **604** can be located near a sensor data source **614** that is a stand-alone light sensor. The sensor data source **614** can include a sensor **616**, such as photodiode, capable of capturing light intensity at the location. The sensor data source **614** can further include a "smart" capability for capturing a light intensity signal from the sensor **616** and converting the light intensity signal to digital data. The sensor data source **614** can include a one-way (sending only) or a two-way (sending and receiving) wireless communication capability **618** for communicating the digital light intensity data to other devices, such as the recipient device **604** by way of a wireless communication capability **608** of the recipient device. The sensor data source **614** can be used for another purpose. For example, the aforementioned stand-alone light sensor data source **614** can be applied to a building as an input of a security system that automatically controls lighting and other security settings based on the digital light intensity data reported from the light sensor data source **614**. In this case, the building system security system is the primary user of the light sensor data source **614** while the recipient device **604** can access the digital light intensity data from the light sensor data source **614** as a secondary, and perhaps temporarily, when the recipient device **604** is near the location of the light sensor data source **614**. In this way, the recipient device **604** can benefit from access to light intensity data for use in modifying a media presentation without incurring the overhead for sensing light intensity.

Sensor data sources **614**, **624**, and **634** can be also incorporated into other devices. In one embodiment, a sensor data source **634** can be a mobile communication device, such as a mobile phone. An audio sensor **636** (microphone) can be built into a mobile communication device, for use in cellular communication. The audio sensor can also be used to capture background audio intensity in the environment where the mobile communication device is located. In this case, the sensor data source **634** has a primary use as a mobile phone and secondary use as a sensor data source for another device, such as the source device **644**. In one embodiment, whenever the mobile phone sensor data source **634** is not being used for cellular communication or for other user activities such as recording audio or video, the audio sensor **636** can be made available for use by other nearby devices, such as the source device **644**. The mobile phone sensor data source **634** can capture an audio signal from the audio sensor **636** and convert this into a digital

audio signal. In one embodiment, the digital audio signal can be a "live" audio signal, such that it contains a representation of the actual audio occurring at the mobile phone sensor data source **634**. In one embodiment, the digital audio signal can merely be an intensity signal that filters out discernable audio content. The mobile sensor data source **634** can share the digital audio data with the source device **644** over a mobility network. In one embodiment, the mobile sensor data source **634** can share the digital audio data with another device, such as the recipient device **604**, by way of an internet link or a wired network.

By receiving sensory data from sensor data sources **614**, **624** and **634** sharing the same environment, the source device **644** or recipient device **604** can collect substantial environmental sensory information. Sharing of sensory data can be via cooperative agreements or opt-in agreements where devices are enrolled by their service provider and are obligated to share sensory data with other devices unless opted out. The sensor data sources **614**, **624**, and **634** can be other media processors **106** or portable communication device **116** within the communication system **100**.

FIG. **7** depicts an illustrative method **700** that operates in portions of the devices of FIGS. **1-6**. Method **700** can be applied to a recipient device **604** or a source device **644** to detect a sensor data source **614**, **624** and **634** capable and willing to share sensory data that has been captured by the sensor data source in the same environment as the source device or recipient device. The method **700** can begin in step **704** where a media processor device, such as a recipient device **604** or a source device **644**, broadcasts a request for sensory data to any sensor data sources **614**, **624** and **634** in the same environment as the media processor device. In one embodiment, the request can be a radio frequency message. The media processor device **604** and **644** can send out a message using, for example, short range radio frequency in the scientific, medical, and industrial (SFI) band. The media processor device **604** and **644** can send the message on Wi-Fi or Bluetooth communications link. In one embodiment, the media processor device **604** and **644** can send out a radio frequency signal capable of reading passive radio frequency identification (RFID) tags on the sensor data sources **614**, **624** and **634**.

The media processor device **604** and **644** can send the message over a cellular network, a wired network, or an internet protocol capable network. The request message can include information identifying the media processor device **604** and **644**. In one embodiment, the request message can include a media access control (MAC) address of the media processor device. The request message can further include information to identify a service provider of the media processor device **604** and **644**. The request message can further include information to identify a group that is sharing sensory data. The request message can further include information to identify a specific type or identity of sensory data needed by the media processor device **604** and **644** or if the media processor device will accept any available data from a sensor data source **614**, **624** and **634**. The request message can be in the form of a request to create a communications link between the media processor device **604** and **644** and an available sensor data source **614**, **624** and **634** or the message can be a continuation of communications from an already established link.

In step **706**, the media processor device **604** and **644** can receive a response sent from any of the sensor data sources **614**, **624** and **634** offering the sensory data. The response can include information about the capabilities of the sensor data sources **614**, **624** and **634**, their respective locations, their service provider, whether they are authorized to share sensory data, or any other relevant information which can be useful to the media processor device **604** and **644**. The response can be sent and received over the same medium as was used by the media processor device **604** and **644** to send the request message. So, for example, the media processor device **604** and **644** can send a request message by way of short range RF communication. The sensor data sources **614**, **624** and **634** then responds via the same short range RF. The response can be sent by way of a different medium. For example, where the media processor device **604** and **644** sends a request message that is capable of reading a RFID tag, the response can be a combination of the RFID reading (identifying the sensor data sources **614**, **624** and **634**) and a message in another medium, such as short range RF that includes further information on a specific sensor data source **614**, **624** and **634**.

In step **708**, the media processor device **604** and **644** can receive sensory information representing sensory data from the sensor data source **614**, **624** and **634**. The sensory information can simply be a digital data reading from a sensor **616**, **626** and **636**. The sensory information can be a set of data readings, such as several different types of sensory data collected by a single sensor data source **614**, **624** and **634** or a series of data points for a single specific sensory data type that have been collected over time. The sensory information can be the products of a statistical analysis of sensory data readings, such as an average value or a weighted average or a moving average.

FIG. **8** depicts an illustrative method **800** that operates in portions of the devices of FIGS. **1-6**. Method **800** can be applied to a recipient device **604** or to a source device **644** to detect a sensor data source **614**, **624** and **634** capable and willing to share sensory data that has been captured by the sensor data source in the same environment as the source device or recipient device. The method **800** can begin with step **804** where a sensor data source **614**, **624** and **634** broadcasts an offer of sensory data to any media processor device **604** and **644** nearby. In one embodiment, the request can be a radio frequency message. The sensor data source **614**, **624** and **634** can send out a message using, for example, short range radio frequency band, Wi-Fi, or Bluetooth. In one embodiment, the sensor data source **614**, **624** and **634** can send out a radio frequency signal capable of reading passive radio frequency identification (RFID) tags on the media processor device **604** and **644**.

The sensor data source **614**, **624** and **634** can send the message over a cellular network, a wired network, or an internet protocol capable network. The request message can include information identifying the sensor data source **614**, **624** and **634**. In one embodiment, the request message can include a media access control (MAC) address of the sensor data source **614**, **624** and **634**. The request message can further include information to identify a service provider of the sensor data source **614**, **624** and **634**. The request message can further include information to identify a group that is sharing sensory data. The request message can further include information to identify a specific type or identity of sensory data offered by the sensor data source **614**, **624** and **634**. The request message can be in the form of a request to create a communications link between the sensor data source **614**, **624** and **634** and any available media processor device **604** and **644** or the message can be a continuation of communications from an already established link.

In step **806**, any of the media processor devices **604** and **644** can send a response to the offering sensor data source **614**, **624** and **634** accepting the offer of the sensory data. The

acceptance response can be sent and received over the same medium as was used by the sensor data source **614**, **624** and **634** to send the offering message. So, for example, the sensor data source **614**, **624** and **634** can send a message offering sensory data by way of short range RF communication. The media processor device **604** and **644** can then respond via the same short range RF. Alternatively, the response can be sent by way of a different medium. For example, where the sensor data source **614**, **624** and **634** sends a request message that is capable of reading a RFID tag, the response can be a combination of the RFID reading (identifying the media processor device **604** and **644**) and a message in another medium, such as short range RF that includes further information on a media processor device **604** and **644**.

In step **808**, the media processor device **604** and **644** can receive sensory information representing sensory data from the sensor data source **614**, **624** and **634**. The sensory information can simply be a digital data reading from a sensor **616**, **626** and **636**. The sensory information can be a set of data readings, such as several different types of sensory data collected by a single sensor data source **614**, **624** and **634** or a series of data points for a single specific sensory data type that have been collected over time. The sensory information can be the products of a statistical analysis of sensory data readings, such as an average value or a weighted average or a moving average.

FIG. **9** depicts an illustrative method **900** that operates in portions of the devices of FIGS. **1-6**. Method **700** can begin with step **902** in which a recipient device **604** can detect a sensor data source **614** for capturing sensory data from a physical environment of the recipient device. In step **904**, the recipient device **604** can receive from a sensor data source **614**, **624**, and **634** sensory information representing the sensory data from the physical environment of the recipient device.

In step **906**, the recipient device **506**, **514** can identify characteristics of the physical environment of the recipient device from the received sensory information. The recipient device **506**, **514** can identify characteristics of the environment of the recipient device from the retrieved sensory information. For example, the recipient device can determine a mean value or a range of values for temperature based on captured temperature data. The recipient device can convert captured video into a standard file format or into a series of still images.

In step **908**, the recipient device **506**, **514** can receive from a source device **512**, **516** media content and sensory information representing characteristics of an environment of the source device. The recipient device **506**, **514** can receive media content from a source device **512**, **516**. The recipient device **506**, **514** can be a media processor **106**, such as a set-top box. The media processor **106** can be connected to the communication system **100** via a gateway **104**. The media processor **106** can deliver media content from the communication system **100** to a media device **108**, such as a television or a computing device. The recipient device **506**, **514** can be a portable communication device **116**, such as a computing device, wireless computing device, or mobile communications device, and can receive media content from the communication system **100** via a mobility network. As with the recipient device **506**, **514**, the source device **512**, **516** can also be a media processor **106**, such as a set-top box, and can be connected to the communication system **100** via a gateway **104**. The source device **512**, **516** can be a portable communication device **116**, such as a computing device, wireless computing device, or mobile communications device, and can receive media content from the communication system **100** via a mobility network.

The media content can be any combination of text, audio, still images, video, three-dimensional images and video, graphics, or computer-generated media, and virtual gaming or avatar-based content. The media content can be associated with television programming, movies, concerts, news, books, articles, audio communication, text messaging, SMS, instant messaging, weather reports, programming information, community information, captioning, video game applications, virtual world applications, applications including avatars, social media applications, and websites. The media content can originate at the source device **512**, **516** or from a service provider operating on the communication network **100**. A service provider can provide limited services, such as only providing media programming, or can provide broad-based services, such as media programming, cellular phone, internet access, and on-demand services. These services can serve as an originating point for all or part of the media content at the source device **512**, **516**. The media content can be a combination of content sourced from the service provider and content generated or modified by the source device **512**, **516**. The media content can be received by the recipient device **506**, **514** directly from the source device **512**, **516**, can be received by the recipient device **506**, **514** from the service provider, or can be received by the recipient device **506**, **514** from the server **530**.

The media content from the source device **512**, **516** can include metadata corresponding to a digital representation of an environment **542**, **546** of the source device **512**, **516**. The environment **542**, **546** of the source device **512**, **516** can be based on sensory data collected at the source device. A recipient device **506**, **514** can also have an environment **544**, **548** that can be represented by sensory data collected at that recipient device. Sensory data can represent an environment **542**, **546** of the source device **512**, **516** or an environment **544**, **548** of a recipient device **506**, **514**. Sensory data representing characteristic of the environment of the source or recipient device can be derived from a "world" in which the device is operating. This "world" can be a physical world or a virtual world. A physical world for a source or recipient device can be described as environmental conditions that can be physically experienced by one consuming media content at the source or recipient device. A virtual world for a source or recipient device can be described as environmental conditions presented by the source or recipient device for a consumer of virtual content to virtually experience. Physical and virtual worlds and the collection, distribution, and use of sensory data representing a physical or virtual environment are further described below with respect to a source device **512**, **516**. However, it is to be understood that similar sensory data can be collected, distributed, and used for representing a physical or virtual environment for a recipient device **506**, **514**. In one embodiment, the sensory data can be derived in a physical environment from sensors **507**, **513**, **515** and **517** as described earlier.

The physical world can be described as a collection of environmental conditions and can be assessed by measuring and collecting sensory data representing these environmental conditions. For example, sensory data can be collected for levels of lighting, temperature, and colors, for background audio, video, and images, and for location details, such as room spatial features, time-zone, season, and type of establishment (home or commercial). The source device **512**, **516** can be described as operating in a sensory environment **546**, **542** that includes a compilation of sensory data for the physical world of the source device. For example,

temperature, light intensity, and colorimetric data, aromatic data, background audio, video, and still images, and location information can be collected at the source device **512**, **516**. Sensory data for the sensory environment **546**, **542** can be captured and/or compiled by sensors **513** and **517** operating in the source device **512**, **516**, or by other devices coupled to the communication system **100**, or by a combination of both.

The sensory data of the physical environment for the source device **512**, **516** can be translated into a standard formats, before being communicated to the recipient device **506**, **514** or to the media adaptation server **530**. For example, raw temperature data can be initially collected at the source device **512**, **516** by direct sensing using a thermo probe. The raw temperature data can be converted into a series of digital readings, statistically converted to a mean temperature or median temperature or range of temperatures as needed. A single temperature, such as the mean or median, or a temperature range can then be reported from the source device **512**, **516** and received at the recipient device **506**, **514**, or server **530**. A similar approach can be used for other sensory data, such as light intensity, colorimetric data, aromatic data, or volume of background sound or audio.

The sensory data of the physical environment for the source device **512**, **516** can include audio, video, and still images. For example, a painting might appear on a wall at the location of the source device. This painting represents a sensory aspect of the physical environment that can be replicated exactly or in modified form at a recipient device **506**, **514**. The painting image can be captured at the source device **512**, **516**, by means of, for example, a camera device. The captured image can be saved as an image file, such as a Joint Photographic Experts Group, or JPEG, image file, or as another image file format. Similarly, background audio content, such as recorded or live music or soundtrack, ambient noise, or any combination of sound present at the source device **512**, **516**, can be captured by means of, for example, a microphone device. The captured sound can be saved as a sound file, such as a Moving Picture Experts Group, or MPEG, sound file, or as another image file format. Similarly, background video or a combination of video and audio or of video, audio, and still images can be captured at the source device. For example, a video camera or a combination of a video camera and microphone could be used to capture video of the environment of the source device **512**, **516**. Video data can be saved, for example, as MPEG video files.

The sensory data of the physical environment for the source device **512**, **516** can include location information. For example, the location of the source device **512**, **516** can be captured by accessing Global Positioning System (GPS) satellite services. If the source device **512**, **516** is physically attached to the communication system **100**, then its location can be determined by reference to the location of other entities of known locations. For example, if the source device **512**, **516** is connected to a router in a building of known location, then the location of the building can be reported as the location. If the source device **512**, **516** accesses the communication system via a component of a mobility network **117**, such as specific cell tower, then the location of the mobility network component can be used.

The sensory data of the physical environment of the source device **512**, **516** can be provided to the recipient device **512**, **514** or the media adaptation server **530**. The sensory data can be sent as streaming data, files, or messages. The sensory data can be continuously updated or can be periodic snapshots of environmental conditions. For example, temperature can reported each hour or can reported continuously with each data transmission. Video data can be sent as a continuous stream or can be converted into a series of still image snapshots to conserve system bandwidth.

Sensory data representing a virtual "world" of a source device **512**, **516** can include environmental components that can be experienced virtually by one consuming virtual media content at the source device **512**, **516**. A virtual world can be an environment that is presented by the source device **512**, **516** as part of some type of virtual media content. Virtual media content can include video game applications, virtual world applications, applications that include avatars, social media applications, and websites. Virtual media content can incorporate scenarios, perspectives, and role-playing attributes that allow a consumer of the virtual media content to mentally experience various aspects of another world, persona, or reality. Virtual media content can include virtual representations of otherwise physical phenomena, such as lighting, temperature, color, aroma, sound, movement, video, images, and spatial relationships. This "virtual" sensory data imitates physical phenomena within a virtual context to bring a sense or "realness" to the experience for the consumer.

Virtual sensory data representing components of the virtual environment can be available at the source device **512**, **516** as digital data that is accessed by a video game or virtual world application executing on the source device. This virtual sensory data for the virtual environment can be accessible by the game or application from graphics data files, MPEG files, JPEG files, and parameter files. The virtual sensory data can also be accessible to the source device **512**, **516** by accessing or parsing these files as saved in local storage or as made available from a network source. The source device **512**, **516** can be used a display device that merely reproduces graphics and audio from a data stream. In such a case, the virtual sensory data can be collected by monitoring run-time data variables available through the operating system of the source device **512**, **516** or available from a graphic card or an audio card.

The sensory data representing the environment of the source device **512**, **516** can be sent to the recipient device **506**, **514** and/or to the server **530**. The sensory data can be sent by way of a "pushing" scheme, where data is broadcast or reported from the source device **512**, **516** to the recipient device **506**, **514** or server **530** as determined by the source device. The sensory data can be sent by way of "pulling" scheme, where data is only sent to the recipient device and/or server when requested by the recipient device and/or server.

The sensory data representing the environment of the source device **512**, **516** can be included with the media content as metadata. The metadata can provide information on the media content. In this case, the metadata can correspond to sensory data collected for an environment of the source device **512**, **516**, where the environment can be a physical or virtual environment a user of the source device would experience as part of the media content. For example, the temperature at the source device can be measured and saved. A user would experience the collected temperatures while viewing media content at the source device. A metadata descriptor of labeled "average temperature" can be created, or tagged, to correspond to a calculated mean value for the collected temperature readings taken at the source device. Similarly, a metadata descriptor of "hourly temperatures" can be tagged to correspond to each hourly value of the set of collected temperatures. Tagging the various sensory data measurement into metadata can be used to provide

an infrastructure for sending and receiving the sensory data in a standardized format along with the media content.

If the media content is streamed from the source device **512**, **516** to the server **530** or to the recipient device **506**, **514**, the tagged metadata can be included within a header, or overhead, section of the data stream. If the media content is sent from the source device **512**, **516** to the server **530** or the recipient device **506**, **514** as a discrete file or series of files, the metadata can be included as a part of one or more of the files or as a separate file. By sending the metadata within the media content data structure, the metadata is automatically included with the media content. Error detection and/or correction techniques, applicable to the streaming or file-based media content data, can be automatically applied on the metadata.

The metadata can be defined as a series of data fields or elements included in an overhead section or file of the media content data. The metadata can be included with the media content using metadata containers which can encapsulate a set of metadata as a group. The metadata containers can be defined according to standard formats, such as the American National Standards Institute (ANSI) standard. The environmental metadata can be included in metadata containers along with other metadata elements associated with media content. For example, the metadata for the sensory data can be included with metadata storing information on copyright owner, artist, data, or genre of the media content. The metadata can be included as encoded data. The metadata can be encrypted.

Individual metadata elements can be used to create a digital representation of the overall environment of the source device **512**, **516**. For example, the metadata descriptors for temperature, such as average temperature and hourly temperature, can be combined with similar metadata descriptors for time of day, date, location, color, location details, and other data collected from the physical or virtual environment. The combination of several or all of the metadata descriptors can be used to establish a digital environment for the source device **512**, **516**. That is, the set of metadata can provide a combination of environmental factors sufficient to describe an overall source device environment. The set of metadata descriptors can be described as a digital representation, or digital model, of the environment. When the set of metadata is sent along with the media content, a digital representation of the environment of the source device **512**, **516** is thereby provided within the media content.

In step **910**, the recipient device can determine at least one difference between the characteristics of the environment of the source device and characteristics of the physical environment of the recipient device. The recipient device **506**, **512** can compare the set of characteristics representing the environment of the source device **512**, **516** with the set of characteristics representing the environment of the recipient device. The recipient device **506**, **514** can compare, for example, a physical environment at the source device **512**, **516** with a physical environment at the recipient device **506**, **514** by comparing the sensory data from each device. For example, the source device **512**, **516** may report bright lighting conditions, such a sunshine, as exhibited by lighting intensity sensory data. By comparison, the recipient device **506**, **514** may have identified low-level lighting conditions based on a cloudy day or nighttime or poor indoor lighting. The recipient device **506**, **514** can compare the lighting conditions as like categories and detect the differences. Similarly, the recipient device **506**, **514** can compare all of the other reported or identified physical sensory data for the two devices, such as temperature, background audio, location, and the like.

For example, the recipient device **506**, **514** can detect that background walls at the location of the source device **512**, **516** are different than those at the location of the recipient device. The recipient device **506**, **514** can detect that the background walls at the location of the source device **512**, **516** are smaller or shaped differently than those at the location of the recipient device. The recipient device **506**, **514** can detect that the time zone at the location of the source device **512**, **516** is different than the time zone at the location of the recipient device. The recipient device **506**, **514** can detect that the source device **512**, **516** is located at tropical latitude while the recipient device is located in a four-season climate that is currently experiencing winter conditions.

The recipient device **506**, **514** can compare value or numerical-based sensory data, such a temperature or light intensity or location coordinates. The recipient device **506**, **514** can also compare content-based sensory data, such as video, audio, or still image content to determine differences and can establish where these differences are attributable to the physical environments of the source device **512**, **516** and the recipient device **506**, **514**. The recipient device **506**, **514** can also compare presentation resources of the recipient device to those of the source device **512**, **516**. For example, the source device **512**, **516** may have sophisticated surround sound audio resources, while the recipient device **506**, **514** has stereo audio presentation resources. Additionally, the source device **512**, **516** may have a high definition display resource, while the recipient device **506**, **514** has a standard definition display resource.

In addition to comparing physical environments, the recipient device **506**, **512** can compare virtual environments. For example, source device **512**, **516** can be presenting a virtual-reality video game while recipient device **506**, **514** can be presenting a virtual application featuring avatars and virtual persons. The source device **512**, **516** and recipient device **506**, **514** can each be presenting a different virtual world, each with a virtual environment made up of many characteristics, to the users of the respective devices. The recipient device **506**, **512** can compare the set of characteristics representing the virtual environment of the source device **512**, **516** with the set of characteristics representing the virtual environment of the recipient device. For example, the source device **512**, **516** may report virtual conditions of out-of-doors, darkness, and a storm in the virtual-reality game as exhibited by sensory data of virtual lighting intensity or virtual precipitation or virtual wind. By comparison, the recipient device **506**, **514** may have identified low-lighting, but calm, indoor conditions, in the avatar-based game. The recipient device **506**, **514** can compare the virtual lighting, weather, and location conditions as like virtual categories and detect differences. Similarly, the recipient device **506**, **514** can compare all of the other reported or identified virtual sensory data for the two devices, such as aroma, background audio, images, and the like. The recipient device **506**, **514** can determine differences and can establish where these differences are attributable to the virtual environments of the source device **512**, **516** and the recipient device **506**, **514**.

In addition to comparing physical-to-physical and virtual-to-virtual environments, the recipient device **506**, **514** can also compare physical-to-virtual and virtual-to-physical environments. For example, the recipient device **506**, **514** can compare, for example, a physical environment reported from the source device **512**, **516** with a virtual environment

presented at the recipient device **506**, **514** by comparing the environment characterizations of each device. A characteristic of the virtual environment presented on recipient device **506**, **514** can be adapted to imitate a real-world, physical characteristic being experienced at the source device **512**, **516**. For example, the source device **512**, **516** can be at a location experiencing a passing train that can be heard as audio and felt as vibration. Characteristics of audio and/or vibration can be reported from the source device **512**, **516**, such as by an audio MPEG file, a background noise measurement (frequency, amplitude), or a vibration reading (frequency, amplitude). The recipient device **506**, **514** can compare the reported physical sensory data to characteristics of the virtual world presented by the recipient device. The virtual world, for example, can be presenting a noisy restaurant where characteristic components of noise and vibration have been simulated. The recipient device **506**, **514** can compare the noise and vibration between the physical world where a train is passing and the virtual world of the restaurant and detect differences that can be important to adapting a media presentation from a physical location of the source device **512**, **516** to the virtual "location" of the recipient device.

In step **912**, the recipient device can modify a presentation of the media content according to the at least one difference between the plurality of characteristics of the environment of the source device and the plurality of characteristics of the physical environment of the recipient device. In step **914**, the recipient device **506**, **514** can adapt a user interface **404** of the recipient device **506**, **514** according to a difference, or combination of differences, between the characteristics of the environments of the source device **512**, **516** and the recipient device. The recipient device **506**, **514** can modify characteristics of a display **410** on a user interface **404** of the recipient device **506**, **514** or of a user interface, such as display **508**, in communication with the recipient device. For example, the source device **512**, **516** can be located in bright conditions, while the recipient device **506**, **514** is located in dark conditions. The recipient device **506**, **514** can detect the difference in environment and adjusts settings on the display **404**, **508**, such as brightness, backlighting, or contrast. The recipient device **506**, **514** can adjust an audio system **412** to account for difference in background noise between the recipient device and the source device **512**, **516**.

The recipient device **506**, **514** can also modify the user interface **404** to account for differences between physical and virtual worlds or between two virtual worlds. For example, a user of the source device **512**, **516**, such as computing device, can be watching a music video within a virtual reality, avatar-based application presented on the computing device (e.g., the user's avatar is watching the video). The user can decide to share this virtual experience with someone else on a recipient device **506**, **514** in the form of a mobile phone. The user of the user of the source device **512**, **516** can initiate a sharing of the music video content with the user of the recipient device **506**, **514** by, for example, sending a text with a link that directs the recipient device **506**, **514** to the source device **512**, **516**. The recipient device **506**, **514** can receive the music video (media content) from the source device **512**, **516** along with sensory data representing the virtual environment that the source device **512**, **516** is presenting. The recipient device **506**, **514** can compare the received, virtual environment characteristics of the source device **512**, **516** with retrieved and identified characteristics of the physical environment of the recipient device **506**, **514**. The recipient device **506**, **514** can determine, for example, that the virtual world presentation of the music video includes a background sound of a virtual fountain. The recipient device **506**, **514** can alter the audio system **412** of the mobile phone to account for the presence of the fountain at the source device **512**, **516** either by adding a fountain sound to a reproduction of the music video through the mobile phone audio system **412** (to share the complete experience of the source device user) or by reducing the playback volume of the music video through the audio system (to account for a quieter listening environment for the recipient device user).

In step **916**, the recipient device **506**, **514** can translate or transcode the media content according to the differences between the characteristics of the environment of the source device **512**, **516** and the characteristics of the environment of the recipient device **506**, **514**. The recipient device **506**, **514** can modify the format of the media content, can change the encoding scheme used for the media content, or can alter the media content to account for the detected environment differences when the media content presented by or on the recipient device **506**, **514**. For example, the source device **512**, **516** can be presenting a live cam video feed of a flock of penguins in Antarctica to a user who is riding on a subway train. The user of the source device **512**, **516** decides to share this television show with a user of a recipient device **506**, **514**. The recipient device **506**, **514** can be presenting, at the same time, a virtual reality application where the user of the recipient device **506**, **514** is "living" in a virtual city. The user of the recipient device **506**, **514** can be attending a football game in the virtual-reality city. A scoreboard at the virtual football game can be used to display video. Various physical world phenomena at the source device **512**, **516** can be retrieved by the recipient device **506**, **514** as sensory data characterizing the source device environment. The recipient device **506**, **514** can detect differences between the source and recipient devices. For example, the recipient device **506**, **514** can transcode the media content from the source device **512**, **516** to work in the virtual environment by converting from a streaming video format to an embedded video format, such as Flash™ video, a trademark of the Adobe Corporation of San Jose, Calif.

In another illustration, the media content can be in the form of content of a virtual reality world being presented on the source device **512**, **516**. For example, the source device **512**, **516** can be presenting a virtual reality application where an avatar of a user "lives" in a house. The house can have elements of home décor such as paintings, wall colors, and landscaping. The user decides to share her home in her virtual reality application with a user of the recipient device **506**, **514**, who is also a "resident" in a virtual reality application. In the context of the virtual reality application, the décor elements can be identified as characteristics of the environment of the user of the source device **512**, **516**. Therefore, the recipient device **506**, **514** can receive the décor elements as characteristics of the source device virtual environment and compare these characteristics to the virtual environment of the recipient device **506**, **514**. The user of the recipient device **506**, **514** can have different décor—paintings, colors, landscaping—at his house. The recipient device **506**, **514** can detect these differences and alter the content of the first user's house, as presented to the second user at the recipient device **506**, **514**. The recipient device **506**, **514** can translate the first house by substituting part of the content of the second house (to make the second user feel more at home in his friend's house).

FIG. **10** depicts an illustrative method **1000** that operates in portions of the devices of FIGS. **1**-**6**. Method **1000** can begin with step **1004** in which a source device **512**, **516** can

detect sensor data sources **614**, **624**, and **624** for capturing sensory data from a physical environment of the source device. In step **1006**, the source device **512**, **516** can receive from the sensor data source **614**, **624**, and **624** sensory information representing the sensory data from the physical environment of the source device.

In step **1008**, the source device **512**, **516** can identify characteristics of the physical environment of the source device from the received sensory information. The source device **512**, **516** can identify characteristics of the environment of the source device from the retrieved sensory information. For example, the source device can determine a mean value or a range of values for temperature based on captured temperature data. The source device can convert captured video into a standard file format or into a series of still images. In step **1010**, the source device **512**, **516** can send media content and sensory information representing plurality of characteristics of physical environment of source device to a second device, such as a recipient device **506**, **514** or the server **530**. The sensory information representing plurality of characteristics of physical environment of source device can be used by a server **530** or by a recipient device **506**, **514** to determine differences between characteristics of the physical environment of the source device **512**, **516** and a set of characteristics of the recipient device **506**, **514**. The set of characteristics of the recipient device **506**, **514** can be physical or virtual characteristics. The presentation of the source-supplied media content can be modified on the recipient device **506**, **514** based differences between the physical environment of the source device **512**, **516** and the physical and/or virtual environment of the recipient device **506**, **514**.

FIG. **11** depicts an illustrative method **1100** that operates in portions of the devices of FIGS. **1-5**. Method **1100** can begin with step **1102** in which a server **530** can receive first sensory information representing characteristics of the physical environment of the source device **512**, **516**. The first sensory information includes sensory data captured by sensor data sources **514**, **524**, and **534** at a physical environment of the source device. In step **1104**, the server **530** can receive second sensory information representing characteristics of the physical environment of the recipient device **512**, **516**. The second sensory information includes sensory data captured by sensor data sources **514**, **524**, and **534** at a physical environment of the recipient device.

In step **1106**, the server **530** can determine difference between characteristics of the physical environment of source device **512**, **516** and characteristics of the physical environment of recipient device **506**, **514**. The server **530** can compare, for example, a physical environment at the source device **512**, **516** with a physical environment at the recipient device **506**, **514** by comparing the sensory data from each device. The server **530** can determine differences and can establish where these differences are attributable to the physical or virtual environments of the source device **512**, **516** and the recipient device **506**, **514**. The server **530** can determine differences between characteristics of the environments of the source device **512**, **516** and the recipient device **506**, **514** by similar means, and with similar capabilities, as can be used by the recipient device **506**, **514**.

In step **1108**, the server **530** can receive media content from a source device **512**, **516**. The server **530** can be used as a media adaptation server. The media content can be any combination of text, audio, still images, video, three-dimensional images and video, graphics, or computer-generated media, and virtual gaming or avatar-based content. The media content can be a combination of content sourced from the service provider and content generated or modified by the source device **512**, **516**. The media content can be received by the server **530** directly from the source device **512**, **516** or can be received by the server **530** from another device of the service provider.

The media content from the source device **512**, **516** can include metadata corresponding to a digital representation of an environment **542**, **546** of the source device **512**, **516**. The environment **542**, **546** of the source device **512**, **516** can be based on sensory data collected at the source device. A recipient device **506**, **514** can also have an environment **544**, **548** that can be represented by sensory data collected at that recipient device. The first sensory data can represent characteristics of the environment **542**, **546** of the source device **512**, **516** that can be derived from a "physical world" in which the device is located or from a "virtual world" being presented by the source device **512**, **516**, as described above. In step **704**, the server **530** can receive second sensory data representing characteristics of an environment **544**, **548** of the recipient device **506**, **514**. The second sensory data can represent characteristics of the environment **544**, **548** that can be derived from a "physical world" in which the device is located or from a "virtual world" being presented by the recipient device **506**, **514**, as described above. Since the server **530** can be located remotely from the recipient device **506**, **514**, the recipient device can report sensory data to the server **530** in a fashion similar to the reporting of sensory data by the source device **512**, **516** described in the prior embodiment.

In step **1110**, the server **530** can modify a presentation of media content according to the differences between the characteristics of the sensory environments of the source device **512**, **516** and the recipient device **506**, **514**. The server **530** can translate or transcode the media content according to the differences between the characteristics of the environment of the source device **512**, **516** and the characteristics of the environment of the recipient device **506**, **514**. The server **530** can modify the format of the media content, can change the encoding scheme used for the media content, or can alter the media content to account for the detected environment differences when the media content is presented by or on the recipient device **506**, **514**. The server **530** can modify the media content by similar means, and with similar capabilities, as can be used by the recipient device **506**, **514**. In step **1112**, the server **530** can provide the modified media content to the recipient device **506**, **514** over the communication system **100**. The sever **530** can provide the modified media content as a file, as streaming data, or embedded in a message.

Upon reviewing the aforementioned embodiments, it would be evident to an artisan with ordinary skill in the art that said embodiments can be modified, reduced, or enhanced without departing from the scope and spirit of the claims described below. In one embodiment, the metadata descriptors can include metadata descriptors to store, transmit, and receive video, audio, or still image content. In one embodiment, the server **530** can retrieve a set of metadata descriptors from the recipient device **506**, **514**, where the recipient device has tagged the collected sensory data into a set of metadata. In one embodiment, the server **530** can retriever a digital representation of the environment of the recipient device **506**, **514**, where the recipient device has tagged the collected sensory data into metadata and has grouped the metadata into a digital representation.

In one embodiment, the recipient device **506**, **514** or the server **530** can use object recognition applications to compare known patterns, objects, shapes, sounds, and/or places

that appear in the video, audio, or still image content reported or identified as being of the source device **512**, **516** and/or the recipient device **506**, **514**. By comparing recognized objects, patterns, shapes, sounds, and/or places, differences in the environments of the source device **512**, **516** and the recipient device **506**, **514** can be determined to guide modification of the media content or of the user interface of the recipient device **506**, **514**. In one embodiment, the recipient device **506**, **512** or the server **540** can use object recognition applications to compare known patterns, objects, shapes, sounds, and/or places that appear in any virtual video, audio, or still image content reported or identified for the source device **512**, **516** and/or the recipient device **506**, **514**. Other embodiments are contemplated by the present disclosure.

FIG. **12** depicts an exemplary diagrammatic representation of a machine in the form of a computer system **1200** within which a set of instructions, when executed, may cause the machine to perform any one or more of the methods discussed above. One or more instances of the machine can operate, for example, as the server **503**, the media processor **506**, the display **508**, computing devices **512**, mobile devices **514**, or combinations thereof as described above. In some embodiments, the machine may be connected (e.g., using a network) to other machines. In a networked deployment, the machine may operate in the capacity of a server or a client user machine in server-client user network environment, or as a peer machine in a peer-to-peer (or distributed) network environment.

The machine may comprise a server computer, a client user computer, a personal computer (PC), a tablet PC, a smart phone, a laptop computer, a desktop computer, a control system, a network router, switch or bridge, or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. It will be understood that a communication device of the present disclosure includes broadly any electronic device that provides voice, video or data communication. Further, while a single machine is illustrated, the term "machine" shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methods discussed herein.

The computer system **1200** may include a processor **1202** (e.g., a central processing unit (CPU), a graphics processing unit (GPU, or both), a main memory **1204** and a static memory **1206**, which communicate with each other via a bus **1208**. The computer system **1200** may further include a video display unit **1210** (e.g., a liquid crystal display (LCD), a flat panel, or a solid state display. The computer system **1200** may include an input device **1212** (e.g., a keyboard), a cursor control device **1214** (e.g., a mouse), a disk drive unit **1216**, a signal generation device **1218** (e.g., a speaker or remote control) and a network interface device **1220**.

The disk drive unit **1216** may include a tangible computer-readable storage medium **1222** on which is stored one or more sets of instructions (e.g., software **1224**) embodying any one or more of the methods or functions described herein, including those methods illustrated above. The instructions **1224** may also reside, completely or at least partially, within the main memory **1204**, the static memory **1206**, and/or within the processor **1202** during execution thereof by the computer system **1200**. The main memory **1204** and the processor **1202** also may constitute tangible computer-readable storage media.

Dedicated hardware implementations including, but not limited to, application specific integrated circuits, programmable logic arrays and other hardware devices can likewise be constructed to implement the methods described herein. Applications that may include the apparatus and systems of various embodiments broadly include a variety of electronic and computer systems. Some embodiments implement functions in two or more specific interconnected hardware modules or devices with related control and data signals communicated between and through the modules, or as portions of an application-specific integrated circuit. Thus, the example system is applicable to software, firmware, and hardware implementations.

In accordance with various embodiments of the present disclosure, the methods described herein are intended for operation as software programs running on a computer processor. Furthermore, software implementations can include, but not limited to, distributed processing or component/object distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

While the tangible computer-readable storage medium **922** is shown in an example embodiment to be a single medium, the term "tangible computer-readable storage medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store the one or more sets of instructions. The term "tangible computer-readable storage medium" shall also be taken to include any non-transitory medium that is capable of storing or encoding a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methods of the present disclosure.

The term "tangible computer-readable storage medium" shall accordingly be taken to include, but not be limited to: solid-state memories such as a memory card or other package that houses one or more read-only (non-volatile) memories, random access memories, or other re-writable (volatile) memories, a magneto-optical or optical medium such as a disk or tape, or other tangible media which can be used to store information. Accordingly, the disclosure is considered to include any one or more of a tangible computer-readable storage medium, as listed herein and including art-recognized equivalents and successor media, in which the software implementations herein are stored.

Although the present specification describes components and functions implemented in the embodiments with reference to particular standards and protocols, the disclosure is not limited to such standards and protocols. Each of the standards for Internet and other packet switched network transmission (e.g., TCP/IP, UDP/IP, HTML, HTTP) represent examples of the state of the art. Such standards are from time-to-time superseded by faster or more efficient equivalents having essentially the same functions. Wireless standards for device detection (e.g., RFID), short-range communications (e.g., Bluetooth, Wi-Fi, Zigbee), and long-range communications (e.g., WiMAX, GSM, CDMA) are contemplated for use by computer system **900**.

The illustrations of embodiments described herein are intended to provide a general understanding of the structure of various embodiments, and they are not intended to serve as a complete description of all the elements and features of apparatus and systems that might make use of the structures described herein. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. Other embodiments may be utilized and derived therefrom, such that structural and logical substitutions and changes may be made without departing from the scope of this disclosure. Figures are also merely representational and

may not be drawn to scale. Certain proportions thereof may be exaggerated, while others may be minimized. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

Although specific embodiments have been illustrated and described herein, it should be appreciated that any arrangement calculated to achieve the same purpose may be substituted for the specific embodiments shown. This disclosure is intended to cover any and all adaptations or variations of various embodiments. Combinations of the above embodiments, and other embodiments not specifically described herein, will be apparent to those of skill in the art upon reviewing the above description.

The Abstract of the Disclosure is provided with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. In addition, in the foregoing Detailed Description, it can be seen that various features are grouped together in a single embodiment for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiments require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter lies in less than all features of a single disclosed embodiment. Thus the following claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separately claimed subject matter.

What is claimed is:

1. A device comprising:

a processor; and

a memory that stores executable instructions that, when executed by the processor, facilitate performance of operations comprising:

detecting a first sensor data source for capturing first sensor data from a virtual environment of the device, wherein the detecting comprises receiving an offer of first sensor information from the first sensor data source;

receiving the first sensor information from the first sensor data source, responsive to accepting the offer of the first sensor information from the first sensor data source, the first sensor information representing the first sensor data from the virtual environment of the device, wherein the virtual environment associated with the first sensor information comprises a first geographic location; and

sending, to a server device, media content and the first sensor information, wherein the media content is presented in the virtual environment, wherein the server device determines a difference between the first sensor information and second sensor information provided to a media processor device by a second sensor data source at a physical environment, wherein the physical environment associated with the second sensor information comprises a second geographic location, wherein the first geographic location is remote and independent from the second geographic location, wherein the media processor device broadcasts a request for the second sensor information at the physical environment, wherein the second sensor data source provides the second sensor information to the media processor device responsive to the request broadcast from the media processor device, wherein the difference is associated with a difference between first characteristics of the virtual environment and second characteristics of the physical environment, wherein the server device adapts a user interface at the second geographic location to modify a presentation of the media content to generate an adapted presentation of the media content at the media processor device at the second geographic location according to the difference between the first characteristics and the second characteristics, wherein the user interface is adapted to present one or more characteristics of the virtual environment resulting in a modification of one or more characteristics of the physical environment, wherein the server device modifies the presentation by transcoding the media content from a streaming video format to an embedded video format that is played on a virtual reality application.

2. The device of claim **1**, wherein the second sensor data source provides the second sensor information to the media processor device responsive to receiving the request broadcast from the media processor device via a radio frequency identification (RFID) tag and transmitting a response to the media processor device via the RFID tag.

3. The device of claim **1**, wherein the second sensor data source comprises a mobile communication device, and wherein the second sensor information comprises second sensor data captured by the mobile communication device.

4. The device of claim **3**, wherein the request broadcast from the media processor device includes an identification of a service provider associated with the media processor device, and wherein the mobile communication device provides the second sensor information according to an opt-in agreement controlled by the service provider.

5. The device of claim **3**, wherein the request broadcast from the media processor device further includes a request to create a communications link with the mobile communication device, and wherein a response from the mobile communication device includes information associated with a capability for capturing the first data at the mobile communication device.

6. The device of claim **3**, wherein the second sensor data captured by the mobile communication device comprises audio data, and wherein the mobile communication device filters content from the audio data.

7. The device of claim **3**, wherein the sensory information includes a statistical analysis of the second sensor data captured by the mobile communication device, and wherein the statistical analysis includes an average, a weighted average, a moving average, or any combination thereof.

8. The device of claim **1**, wherein the first sensor data from the virtual environment of the device further comprises motion data, orientation data, or any combination thereof.

9. The device of claim **1**, wherein the device comprises a set-top box, a mobile communication device, or a portable computer device, and wherein the second sensor data source comprises a set-top box, a mobile communication device, or a portable computer device.

10. The device of claim **1**, wherein the first sensor information comprises a statistical analysis of the first sensor data.

11. The device of claim **1**, wherein the first sensor information is included in the media content as metadata.

12. A method comprising:

detecting, by a device comprising a processor, a first sensor data source for capturing first sensor data from a virtual environment of the device, wherein the detecting comprises receiving an offer of first sensor information from the first sensor data source;

accepting, by the device, the offer of the first sensor information from the first sensor data source;

receiving, by the device, first sensor information from the first sensor data source capturing the first sensor data from the virtual environment of the device responsive to accepting the offer of the first sensor information from the first sensor data source, wherein the virtual environment associated with the first sensor information comprises a first geographical location; and

sending, by the device, to a server device, media content and the first sensor information, wherein the server device determines a difference between the first sensor information and second sensor information provided to a media processor device by a second sensor data source at a physical environment, wherein the physical environment associated with the second sensor information comprises a second geographic location, wherein the first geographic location is remote and independent from the second geographic location, wherein the media processor device broadcasts a request for the second sensor information at the physical environment, wherein the second sensor data source provides the second sensor information to the media processor device responsive to the request broadcast from the media processor device, wherein the difference is associated with a difference between first characteristics of the virtual environment and second characteristics of the physical environment, and wherein the server device adapts a user interface at the second geographic location to modify a presentation of the media content at the media processor device to generate an adapted presentation of the media content at the second geographic location according to the difference between the first sensor information and the second sensor information, wherein the user interface is adapted to present one or more characteristics of the virtual environment resulting in a modification of one or more characteristics of the physical environment, wherein the server device modifies the presentation by transcoding the media content from a streaming video format to an embedded video format that is played on a virtual reality application.

13. The method of claim **12**, wherein the second sensor data source provides the second sensor information to the media processor device responsive to receiving the request broadcast from the media processor device via a radio frequency identification (RFID) tag and transmitting a response to the media processor device via the RFID tag.

14. The method of claim **12**, wherein the second sensor data source comprises a mobile communication device, and wherein the second sensor information comprises second sensor data captured by the mobile communication device.

15. The method of claim **14**, wherein the request broadcast from the media processor device further includes a request to create a communications link with the mobile communication device, and wherein a response from the mobile communication device includes information associated with a capability for capturing the first data at the mobile communication device.

16. The method of claim **14**, wherein the second sensor data captured by the mobile communication device comprises audio data, and wherein the mobile communication device filters content from the audio data.

17. A device, comprising:

a processor; and

a memory that stores executable instructions that, when executed by the processor, facilitate performance of operations comprising:

receiving first sensor information representing first characteristics of a virtual environment of a source device, wherein the first sensor information comprises first sensor data captured by a first sensor data source at the virtual environment of the source device, wherein the virtual environment associated with the first sensor information comprises a first geographic location, and wherein the first sensor data is received at the source device responsive to the source device accepting an offer of the first sensor information from the first sensor data source;

receiving second sensor information representing second characteristics of a physical environment of a media processor device, wherein the second sensor information comprises second sensor data captured by a second sensor data source at the physical environment of the media processor device, wherein the physical environment associated with the second sensor information comprises a second geographic location, wherein the first geographic location is remote and independent from the second geographic location, wherein the media processor device broadcasts a request for the second sensor information at the physical environment, and wherein the second sensor data source provides the second sensor information to the media processor device responsive to the request broadcast from the media processor device;

comparing the first sensor information and the second sensor information;

determining a difference between the first characteristics and the second characteristics based on the comparing;

receiving media content from the source device, wherein the media content is presented in the virtual environment; and

adapting a user interface at the second geographic location to modify a presentation of the media content at the media processor device to generate an adapted presentation of the media content at the second geographic location according to the difference between the first characteristics and the second characteristics, wherein the user interface is adapted to present one or more characteristics of the virtual environment of the source device resulting in a modification of one or more characteristics of the physical environment of the media processor device, wherein the adapting of the presentation of the user interface comprises transcoding the media content to an embedded video format that is played on a virtual reality application.

18. The device of claim **17**, wherein the executable instructions further facilitate the performance of operations comprising providing the adapted presentation to the media processor device over a communication system.

19. The device of claim **17**, wherein the second sensor data source comprises a mobile communication device, and wherein the second sensor information comprises second sensor data captured by the mobile communication device.

20. The device of claim **17**, wherein the transcoding of the media content further comprises generating an avatar of a user.

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